

# ZEN Of ZBrush

Written By: Mike Jensen

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4509 Badlands Dr  
Ft Worth, TX 76179

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## Creating Z-Spheres

To start the Drone I used ZSpheres. This is the fastest way to get the desirable proportions you are looking for. With ZSpheres I always start with the chest area; anywhere in the torso would be ok to start your ZSpheres.



Illustration 1.1

I kept adding ZSpheres until I got the extremities. I made sure to keep all the ZSpheres a bit thinner than I wanted the model to be, because eventually the ZSketch would move the model to the proper thickness. In the beginning it's important not to get too excessive with the ZSpheres; only use what you need at first. This avoids a lot of trouble when modifying the structure of an armature.





Illustration 1.2

Once I had the basic structure, I added ZSpheres in between existing ones to flesh out areas that needed a bit more definition. Initially I wanted the Drone to be hunched over, but eventually decided to give it better posture. The ZSpheres on the back, chest, and head are in place to act as an anchor for some of the ZSketch.



Illustration 1.3

I see a lot of people creating the hands by using one ZSphere for the palm, and then extend the digits from that. I find that hands work better if you create the hand like it looks in

skeleton form. That means the palm actually consists of four ZSpheres situated close to each other. The new Unified Skin feature for ZSketch means you don't have to worry about the palm being separate ZSpheres. Also, it's good to give the wrist two ZSpheres; this makes it easier to pose.



Illustration 1.4

## ZSketching

After I was happy with the ZSphere armature, I started on the ZSketch. Like the ZSpheres, I wanted to start with the upper torso. Before starting in on the torso however, I had to first create the biceps; the upper portion of the bicep inserts under the pectorals. After that I was able to start not only fleshing in the back and chest muscles, but also give a hint at the lower part of the rib cage. It's important to remember it's not only muscles we're adding at this stage, but everything under the skin. For areas like the lower torso where no definition is required, it's ok to simply trace over the existing ZSpheres. This is an easy way to make sure that you don't have any holes in your mesh when converting to a Unified Skin. Notice that I've also done this to the forearm area as well.



Illustration 2.1

I then started adding the muscles of the legs and lower torso. It tends to be an easier and faster process if you can keep one muscle grouping to one ZSketch stroke. I was able to do this with the upper legs, as their forms are straight forward. The glutes didn't lend themselves to this technique because of their complicated form. In this case it was easy to add several strokes and modify them with the Bulge, PushPull, and Float brushes. If you

don't get the brush stroke correct the first try, you can usually fix it by using these brushes. The Smooth2 brush works great for muscles, tapering the tops and bottoms of a stroke.

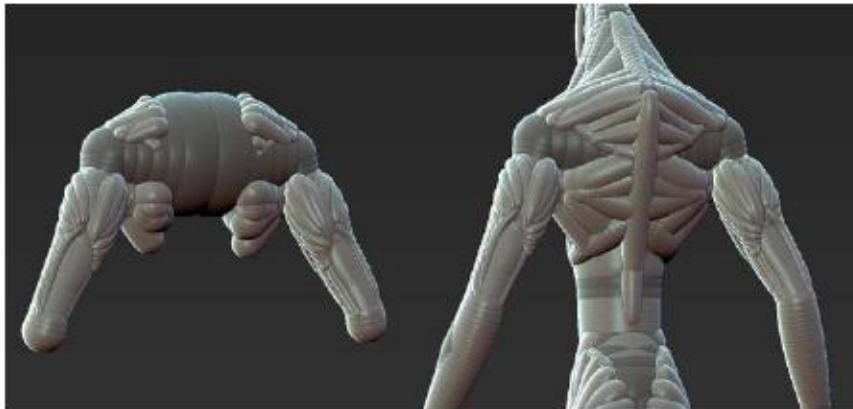


Illustration 2.2

Sometimes it may be hard to reach a muscle or draw all the way from its origin to its insertion point. In this case it's easiest to hide everything you're not working with. I did this when working on the triceps. Notice that the triceps employ the same technique as the glutes. Since they have an extremely unique form, this is the easiest way to execute them.



Illustration 2.3

It's important to illustrate the difference between a quick stroke and a slow stroke when working with ZSketch. The faster you stroke, the less spheres will result. With this in mind, it's usually more advantageous to stroke slowly and accurately.



Illustration 2.4

Another thing to remember is to mask the areas you're happy with, especially when working directly on top of those areas. This way smoothing doesn't jump to complete parts.



Illustration 2.5

After the triceps I refined the chest and back more, and added the deltoids



Illustration 2.6

Then I added the lower legs. I try to keep it as close to human anatomy as possible. Remember Gray's Anatomy is a fantastic and free resource you can use to check the accuracy of your muscles. It's available freely online.





Illustration 2.7

I decided to refine the ZSpheres of the face. I knew roughly what structure I wanted, and it was quicker to use ZSpheres to define it. After I had the spheres I could simply brush on the ZSketch strokes and smooth them out. They would average over the face.



Illustration 2.8

Finally I filled in the forearms and hands. For the fingers I used the same technique of the lower torso; just trace over the existing ZSpheres

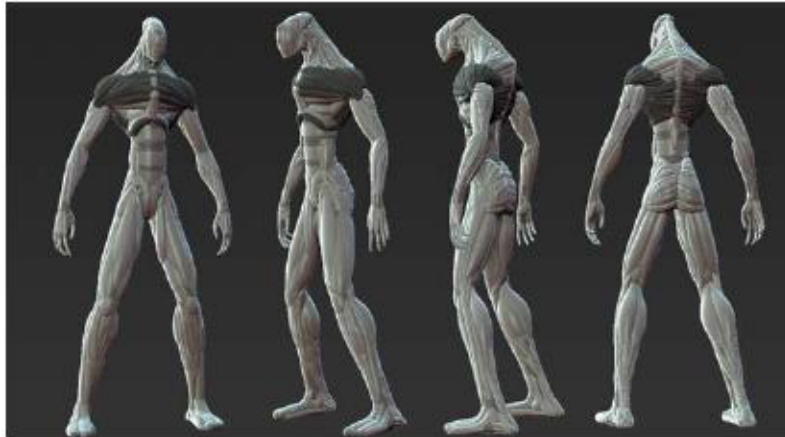


Illustration 2.9

Once I finished the ZSketch model, I needed to get a sculpt-able mesh. The most controlled way to do this is to open the Unified Skin tab in the Tool Palette. For the resolution slider I used the highest possible (1024) then pressed the “Make Unified Skin” button. As seen in illustration 2.10 on the following page this is what I came up with.

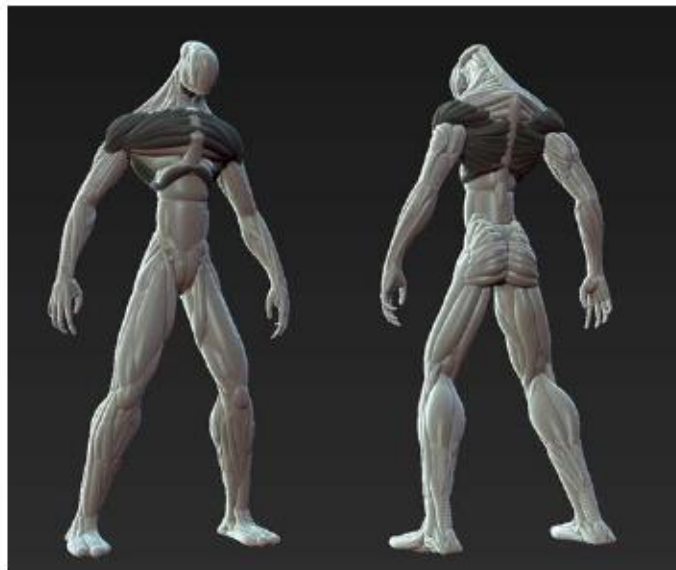


Illustration 2.10



## Concepting the Base Mesh

Before I started working, I knew the type of mech I wanted to create. I wanted a segmented body with many different armor parts. I also knew that I wanted the flow of the armor to mimic the flow of human musculature.



Illustration 3,1

I smoothed the mesh out a little bit, and used a narrow brush to segregate parts of the model I thought looked good. This is largely a trial and error process. If you can visualize where you want to separate areas, you can skip this step. Also note the material change. During sculpting it's good to apply several different materials, to make sure that your mesh looks good regardless the material.

After this I started working on the initial sculpt of the drone. For this process I didn't worry about the cleanliness of the mesh or how accurate the edges of the armor are. This is because once I was happy with the overall form, I planned to retopologise. After retopologising the mesh, I would be able to clean up the messy areas. For this process I used the ClayTubes, hPolish, Standard, Dam\_Standard, Pinch, PlanarLine, and Smooth brushes.

Here is the general process I use to create separate areas:



Illustration 3.2

First, I use the Dam\_Standard brush to define the outline of the piece I want. After I have the outline, I use the ClayTubes brush to push in the outer part of the previous brush stroke. The ClayTubes brush is perfect for this because it tends to average surfaces out. Then I make another Dam\_Standard brush stroke to determine another change in surface direction change.



Illustration 3.3

After this, I use the ClayTubes with zadd on to average out my previous stroke with the rest of the surface. To clean everything up, I use the hPolish brush and stroke in the same direction I want the flow to go. To add the separation detail, I use the Dam\_Standard brush and then the pinch brush to tighten everything up.



Illustration 3.4

Finally, I use the hPolish brush to soften the marginal areas. To clean the border up I use the Smooth brush and apply it around the edge.

For the body, I was inspired mainly by Evangelion models. I wanted something similar to the Eva-02 mech. When trying to replicate it, however, I found that it didn't work. As a result I went through several chest iterations.



Illustration 3.5

Initially I wanted the chest to be pointed and very angular. These two iterations look bland and don't convey the look of a mech.



Illustration 3.6

I found that pulling out the areas under the pectorals made the chest feel more solid and whole. I also softened the crease in the center of the chest, and changed the top of the chest from point up to down. This created a nice flow, and made the area look as if it belongs on top of the pectorals.



Illustration 3.7

Here I started to add cylindrical exhaust ports under the arms and on the shoulders. I wanted exhaust ports to be a theme on the mesh. The chest is also more defined at this point.



Illustration 3.8

I continued to add cylindrical exhaust ports. Notice the port on the second torso segment. After modifying it for some time, I found a chest I liked. All I had to do from here on out is refine the chest until it is a more defined.



Illustration 3.9

I used the Flatten and hPolish brushes to clean up everything. I also used the Dam\_Standard brush to add a few cuts in the chest and the lower torso. To create the more detailed exhaust ports at the top of the chest, I used the layer brush. First I carved a hole in, then elevated a smaller area out, and finally pushed an even smaller part in. (Seen in Illustration 3.9)

Notice that although the chest is clearly defined, it isn't perfect. There are a lot of surfaces and edges that are wavy. This wasn't a concern, because I planned to fix the surface after retopologising.

The back was equally difficult to conceptualize. I went through several iterations to reach a product I was happy with. One thing I had to be concerned with while working on the back was consistency. Making each part of the mech look like they belong together will add a lot to believability. Otherwise it could end up looking like it was designed by different people.



Illustration 3.10

After smoothing out the back (like everywhere else) I pulled out the spinal area. The stroke that crosses the spine is meant to be a thin long bar that attaches the shoulder to the spine. Its function would be similar to the clavicle.



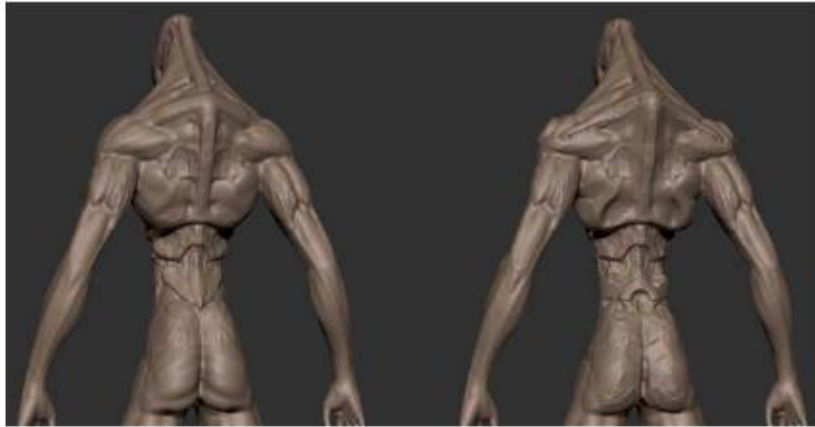


Illustration 3.11

I pulled out the climax of the spine a bit more, and refined the lower back. The first iteration of the lower back looks more like carapace. I wasn't too fond of it so I kept refining it. Also notice that the clavicular line I was talking about before is a bit more defined and now inserts half-way through the shoulder. (Seen in Illustration 3.11)



Illustration 3.12

I continued to play around with the upper back and try new forms. Playing around with a few round exhaust ports near his trapezius area produced some interesting results. It still didn't feel exactly right at this point, however.



Illustration 3.13

I continued to refine the area trying to find the correct form. The outer back wasn't working at this point, as the flow was almost working against what was around it. The neck also didn't fit with the rest of the body. It had a lot of hard edges and didn't flow very well.



Illustration 3.14



The upper back kept evolving until I got something I like. The second image above is the rough shape I have in the end. I got rid of the exhaust ports and it helped the look a lot.

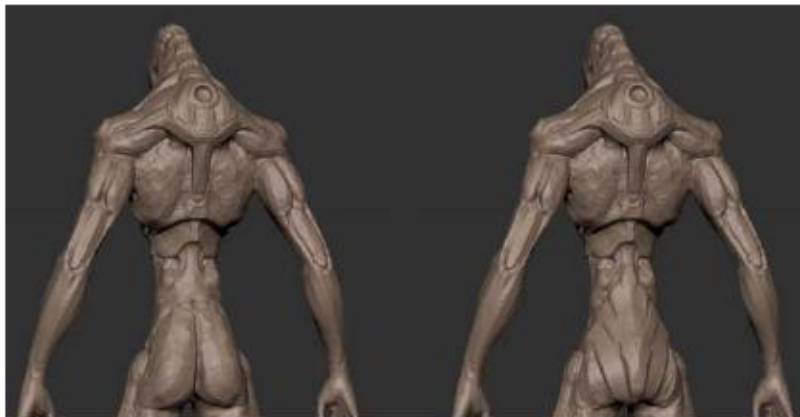


Illustration 3.15

I kept refining the upper back and started working on the buttocks. I thought that leaving a crack between the cheeks would be distracting, so I decided to bridge them.



Illustration 3.16

The glutes were added conforming to their natural shape.



Illustration 3.17

The back was refined to try a different type of exhaust port. This version is closer to the final, but there are still a lot of changes to make. I also continued to clean up the lower torso.



Illustration 3.18

The upper back has taken on its final form. The cylindrical hole in the back is a placeholder for something more complex. I didn't add that until after the retopology. The image above shows the spine in its final form.



Illustration 3.19

After several iterations I arrived at a good look. The upper back flows well with the spine and nothing looks out of place. The neck has also been changed to mimic the lower spine. Again, I'm not worried about the messy look of the mesh, because that is fixed after Retopology.

For the most part the arm was very straight forward. All I had to do was follow the already defined flow of the muscles. The triceps went through a few changes however.

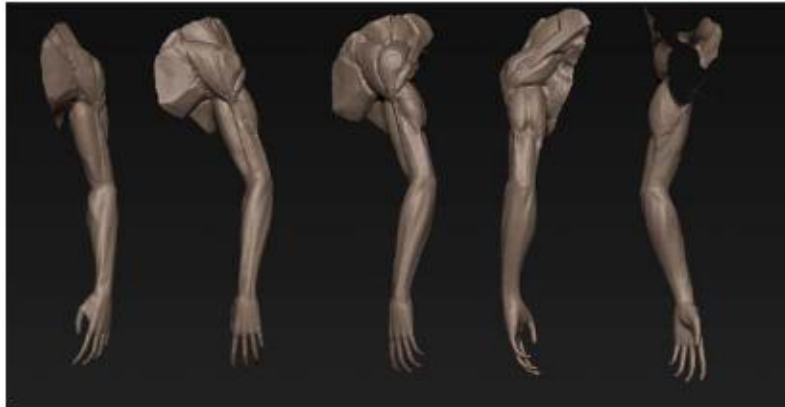


Illustration 3.20

I began, like everything else, by smoothing out the arm a little bit. I made sure not to apply the smooth brush to the hands, because of their low resolution. Had I smoothed them, they would have shriveled up and lost their structure.



Illustration 3.21

I segmented the shoulder and added an exhaust port in the middle segment. I also started adding structure to the back of the arm under the triceps.



Illustration 3.22

I continued to refine the deltoids until I got something that was clean. At this point I also structured the bicep, and added a tendon-like structure connecting the shoulder to the forearm. This gives the illusion of some function. The hPolish brush was dominate here.



Illustration 3.23

Finally I got the triceps formed. By this point the upper arm is nearly finalized. I'm also following the muscular contour of the forearm to create the armor's structure.



Illustration 3.24

I continued to segment and structure the forearm. I found that pulling out the wrist bone helped add to the lanky feeling I wanted the character to portray.

The arm is now finalized at this point.



Illustration 3.25

Here's a closer view of the arm. The flow of the muscles matches the back fairly well. Again it's not the smoothest thing, but at this point that's not important.





Illustration 3.26

The legs were fairly straight forward. Because I invested a good amount of time in the ZSketch I was able to simply follow the existing lines closely



Illustration 3.27



I started off creating a beam that would serve as the base to the leg. This adds a more solid aspect to the model since most other parts appear to be made of a softer material.



Illustration 3.28

I continued to work on the front of the legs. I started to define the knee guards and also the segregation of the armor pieces. Since I'm working on building up shapes I'm using the ClayTubes Brush for building up the surfaces, with the Dam\_Standard brush to cut between the armor pieces.



Illustration 3.29

I then used the Flatten and hPolish brushes to clean up the area. It's not necessary to use the Flatten brush, but at times it can lend more control than the hPolish brush. I also altered the knee caps heavily. I wanted them to be curved outward from the legs to give them a sharper and more angled form.



Illustration 3.30

I continued the process of using the Flatten and hPolish brushes to smooth out the upper legs. In order to define hard edges I use the Dam\_standard brush as well as the ClayTubes brush, which was outlined earlier in the book.



Illustration 3.31

I moved on to the back of the legs making sure to leave some room for the leg to bend. Also notice that the lines I used follow the original contours of the ZSketch.



Illustration 3.32

Finally I moved on to the lower legs and the feet. Notice that I only worked on one side, because once that is done I was able to use Smart ReSym to project the changes from one side to the other.



Illustration 3.33

I thought I was done at this stage. Once I zoomed out to look at the whole model, however, I felt that the feet were too solid-looking and large. They don't appear as if he can run comfortably in them. Because of this I went for a bit of a softer approach.



Illustration 3.34

Here is the final version of the legs on the concept sculpt. The feet aren't very clearly defined at this point but they do convey the general direction I want to take them. As they were at this point, they look a bit small. This is fixed during the retopology as well.

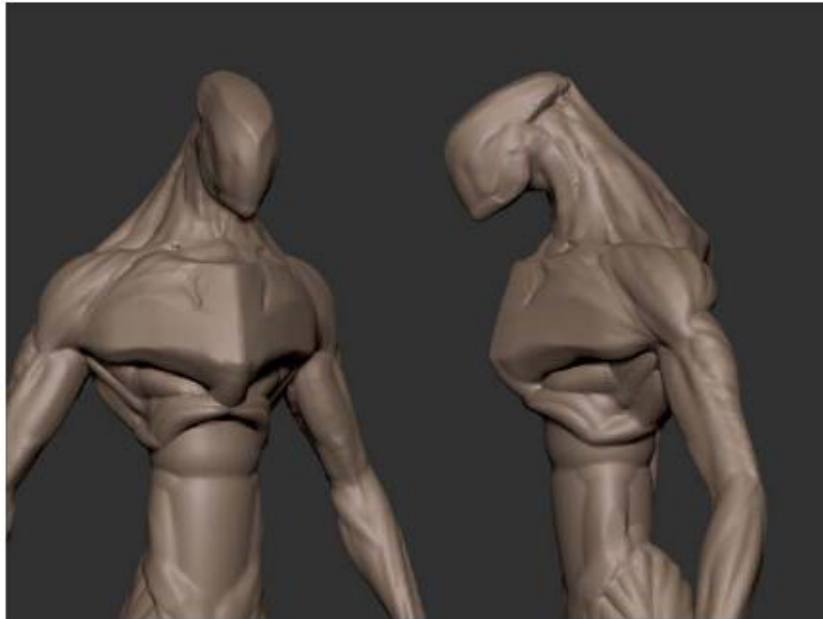


Illustration 3.35

Finally I moved on to the head. At this point I had no idea what direction I wanted to take it. I tried several things and eventually stumbled on something I liked. The sharpness on the face in the image above is due to the hPolish brush. The hPolish brush is fantastic for creating hard edge mechanical details.

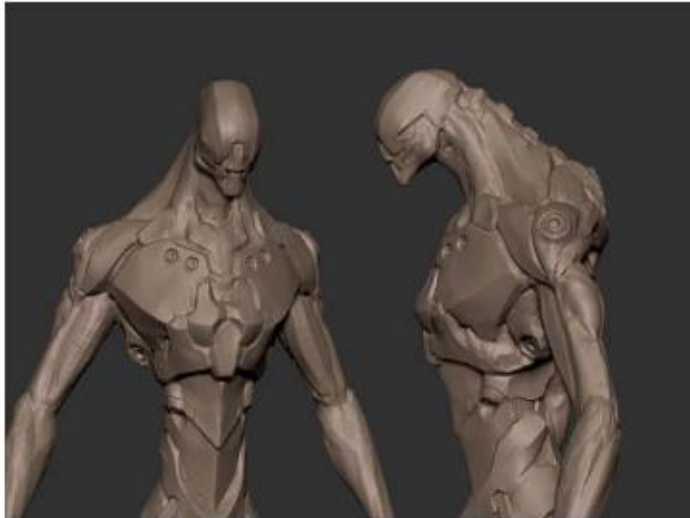


Illustration 3.36

Once I started to segment the head I found a direction to go. At this point I wasn't happy with the visor. It bulges too much and doesn't match the sleek look of the torso. Also the jaw needed to be more defined and serve a purpose at this point.



Illustration 3.37



I then used the Move brush to tighten up the visor and make it appear less bulgy. I also started defining the back of the head and jaw area. I thought the jaw would be a good area to place a breath exhaust port.



Illustration 3.38

Eventually I came to this look. The front of the visor was cut into using the hPolish brush. This gives the face a more angular look that matches the torso a little better.



Illustration 3.39

Then I cleaned up the face a bit more and added decals to the top of the visor. These weren't meant to be final, but simple placeholders. I used custom created alphas with DragDot to place them. I'll go creating several custom alphas later during the tutorial.



Illustration 3.40

After that I made some proportional changes; I elongated the face and pulled the chin down a bit. Here I didn't worry about the neck cause that could be better defined during the Retopology.



## Retopology and Smoothing



Illustration 4.1

Once I had my concept sculpt done, it was time to retopologise. Retopologising allows more control over areas and can also allow some harder surface changes on the mesh. My goal was to cut the model up into its major body parts, and retopologise each of those separately. Each of these parts was arranged into a subtool where it would be easier to isolate and refine. I started on the arms, but anywhere is fine to start.

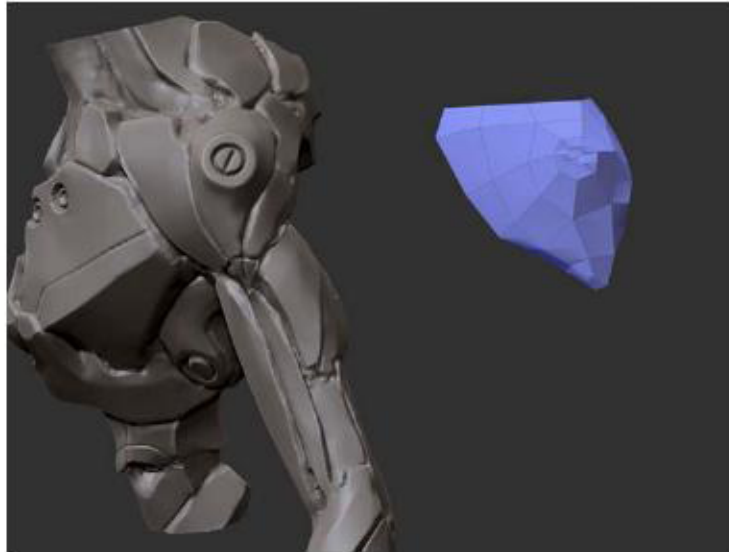


Illustration 4.2

I started with the shoulder because it was one of the more integral parts. The important thing to notice is how basic the retopologised mesh is. All I wanted out of the retopology is to get the general shape down with good edge flow. It's important to try to make all of your new polygons four sided. Also, I try to make sure most of my vertices attach to four or less edges. I find that sometimes if you have vertices that attach to several edges a pinch can occur in the mesh. Both of these rules don't need to be followed exactly however. In my shoulder mesh I have a triangle or two. If you work too hard to eliminate all of the mesh imperfections it usually simply translates into time lost. In contrast, it's extremely important to have all of your polygons relatively the same size. This way when higher subdivisions are reached all areas have equal density.



Illustration 4.3

After this I added the retopologised mesh to the concept sculpt as a subtool. I then went into the geometry tab in the tool palette and unchecked the Smt button. With Smt off, the mesh will subdivide without applying smoothing to it. This is important when working with a very simple mesh, because the forms made during the retopology process will be altered a bit, which is undesirable

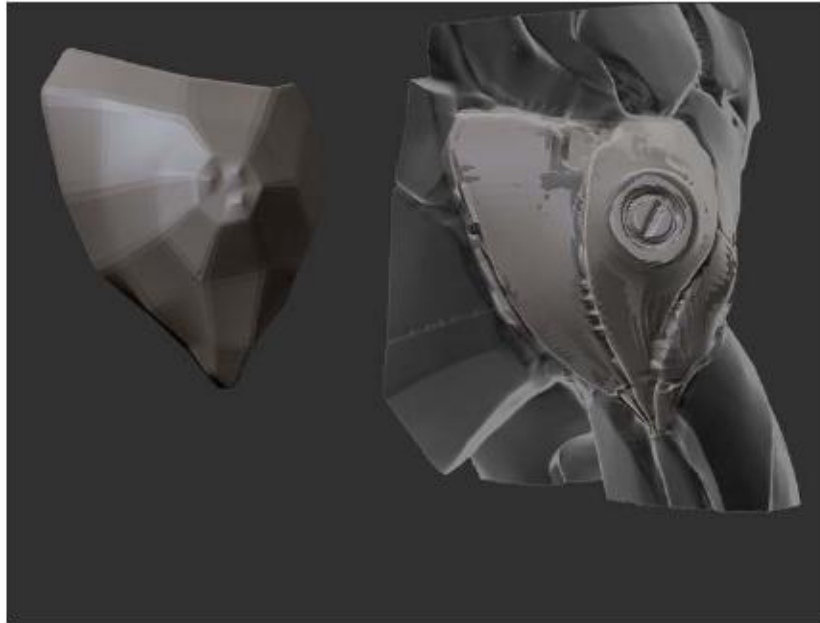


Illustration 4.4

To project the new mesh to the old mesh I used a combination of ProjectAll from the SubTool palette as well as the ZProject brush. When using the ZProject brush, you must turn on Zadd to get the brush to affect the mesh. It's also a good idea to turn on BackfaceMask in the Brush palette under Auto Masking. This ensures that the other side of the mesh will not be projected in the wrong area. As of Zbrush 3.5 r3, in order for ProjectAll to work correctly, the PA Blur must be a multiple of 8 (currently it defaults to 10). Once I had the mesh projected at the current sub division level, I subdivided a few more times, and applied projection again. It's good to project after every two subdivisions or so, because at times if the mesh is too high resolution the projection will take a long time. Also, after the first two subdivisions, I turn back on smooth in the Geometry pulldown.



Illustration 4.5

After fully projecting all the areas I wanted to, I began to modify the new mesh.

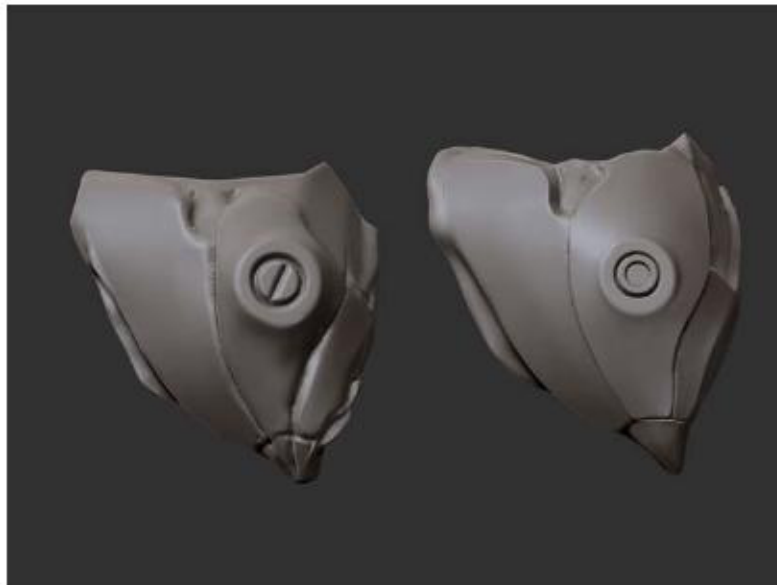


Illustration 4.6

Mainly I used the hPolish brush to create a clean looking mesh. To create the raised and lowered areas (that separates the shoulder into three pieces) I used a combination of the hPolish brush and masking.



Illustration 4.7

The method I used to create the port in the shoulder is quite simple. I used the flatten brush to create a flat surface in the middle of the shoulder, and then used the layer brush to push in a hole. Then using the same brush I pulled out an area and pushed it in again. These types of surface details can also be added using alphas, which I'll demonstrate later.



Illustration 4.8

Then I moved on to the upper arm. The upper arm has many pieces, so I decided to separate it into 3 major meshes. I could have retopologised three times for the upper arm, but I felt it was easier to make one and use it three times. This way I would have more control of the mesh without having to use several masks.



Illustration 4.9





Illustration 4.10

I projected the upper arm onto my new mesh, and then copied the mesh two times into new subtools. Then I decided which mesh would constitute which portion of the upper arm. If I didn't want a piece of the upper arm on one of the meshes, I would use the clayTubes brush to push it inside the other mesh so it was not visible. This is the reason for the parts of messy looking mesh you see above.



Illustration 4.11

With all three subtools visible the upper arm looks like this. Again, the upper portion and lower portion are messy, but since they will not be visible it's not an issue.



Illustration 4.12

I then added the shoulder as a SubTool, and did a little work to make them fit well together.



Illustration 4.13

I then went on to the forearm. Again, I made a very basic mesh, with respect to edge flow. Once projected the forearm I duplicated the mesh and separated it out like before.



Illustration 4.14

Above you can see the pieces separated out. The leftmost piece didn't need all of the mesh, so to conserve memory I deleted everything that was hidden. It's a good idea to delete parts of the mesh that will not be visible, because they will only be a problem.

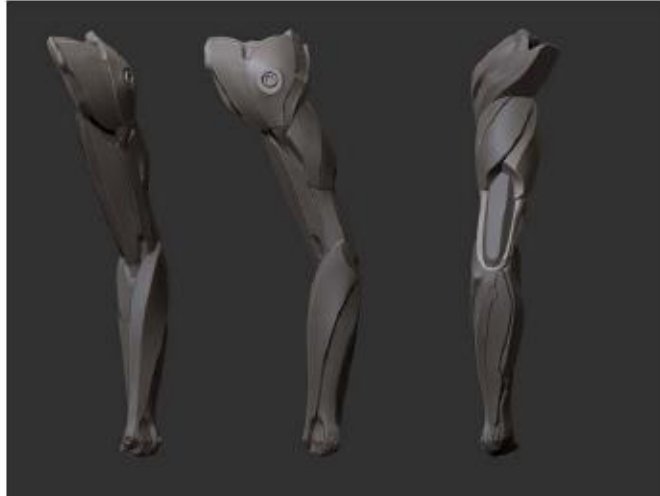


Illustration 4.15

Finally I merged the forearm together with the upper arm, making sure all the pieces fit well together. The pieces that connect the forearm and the hand haven't been created at this point. They will be created at the same time the hand is.

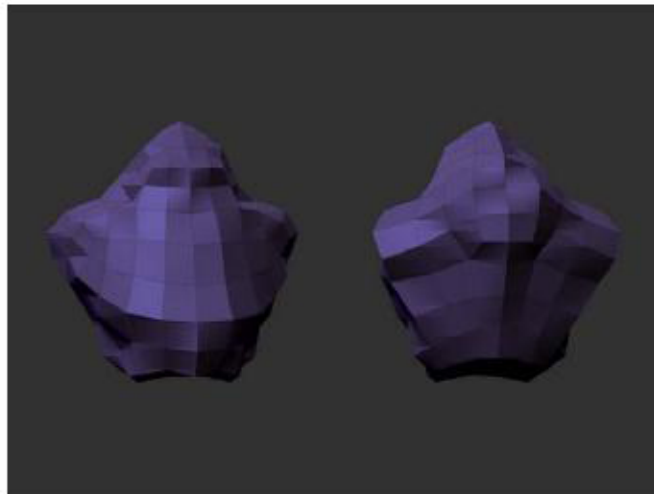


Illustration 4.16

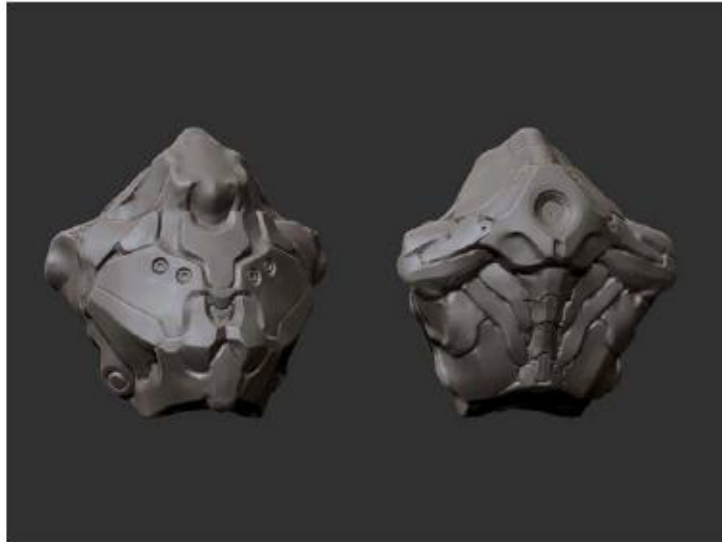


Illustration 4.17

I then moved on to the torso. I created a very basic base mesh, making sure all the polygons were relatively the same size. Then I used projection to capture everything around it.



Illustration 4.18

I then added a part of the finished arm to use as a guide. This would help make the pieces look like they fit together.

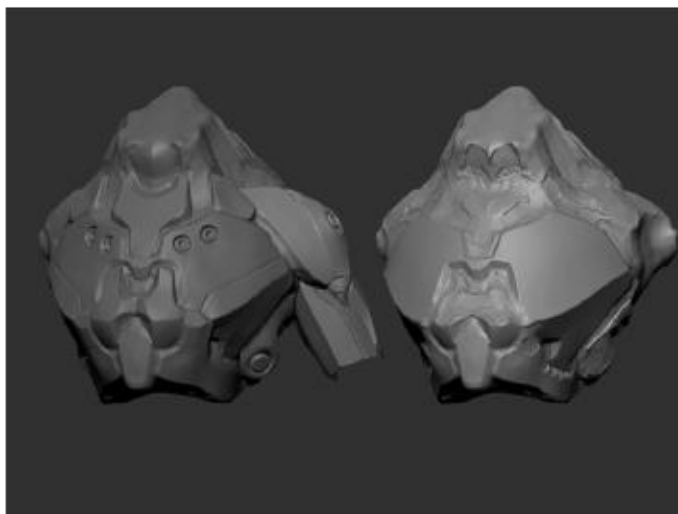


Illustration 4.19

I then started smoothing out the chest piece. Since this particular SubTool only contains the chest piece, I used the clayTubes brush to push everything in so it doesn't compete with the other subtools.

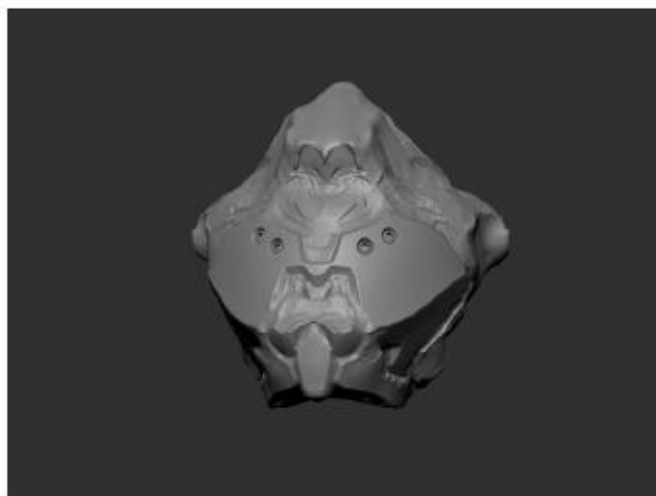


Illustration 4.20



I wanted to test out a few details. Using the standard brush I pushed in a curved hole. Then I used the layer brush to pull out the center and finally push it back in again. To get the outer rim of the detail looking better I used the hPolish tool to clean it up. This can also be done with alphas, which I'll show later.

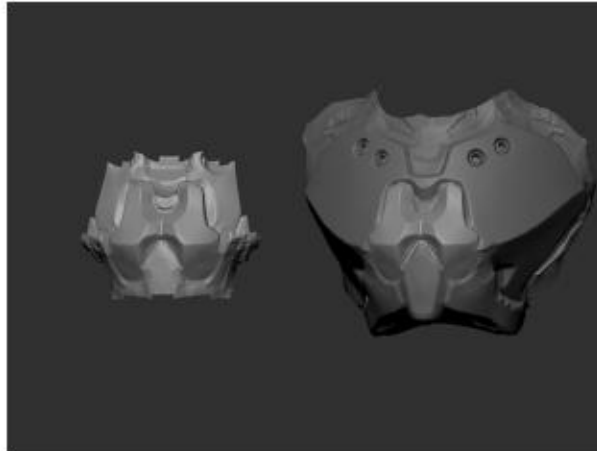


Illustration 4.21

To create the second piece I copied the first SubTool, and deleted all the geometry I didn't need. This piece was very simple to finish off. The only brush I used to clean it up was the hPolish brush.



Illustration 4.22

I continued on with the next piece of the torso. Again I deleted the extra polygons and used the hPolish brush to clean it up.

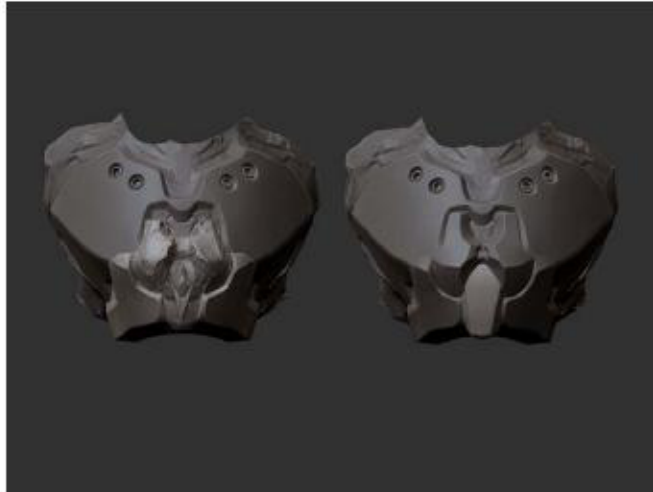


Illustration 4.23

I moved on to the lower chest area, separated it, and cleaned it up with the hPolish brush. Also remember that hPolish can be used in sub to build up the mesh. It's very powerful for creating crisp edges.

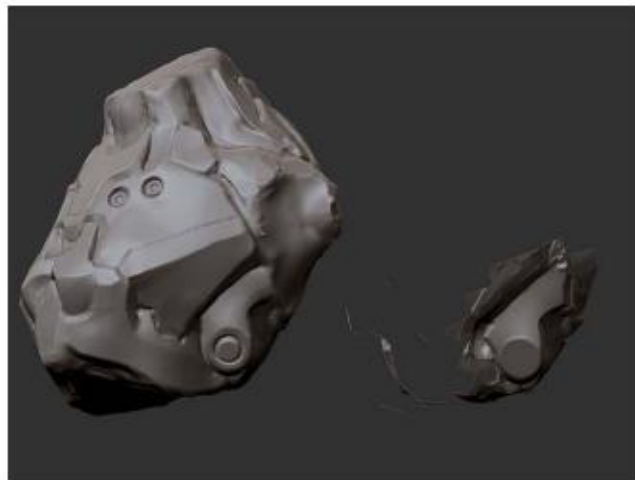


Illustration 4.24

Again I broke off the latissimus dorsi area and cleaned it up. For this piece I used hPolish for all the areas first. After everything was smooth, it left me with an oblong circle. I made it circular again by going over it with the flatten brush.



Illustration 4.25

Then I added details to it similar to the chest, mimicking an exhaust port of some kind.

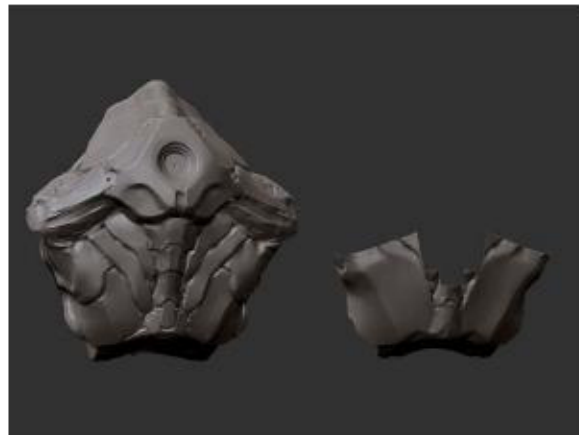


Illustration 4.26

I then moved on to the lower part of the latissimus dorsi. Notice that the only areas that are smooth are the ones that will be visible with all the subtools turned on. There's no need work on the parts of the mesh that will never be seen. Also notice that the edges look like they are from a lower subdivision. When cutting a lot of the pieces up, I use a lower subdivision level. It's not necessary, but often times a lower subdivision might be needed to tweak the mesh. It's also important if the mesh will be posed, since transpose master will include all subtools into one mesh to be posed. If the mesh is too dense the computer could lock up.

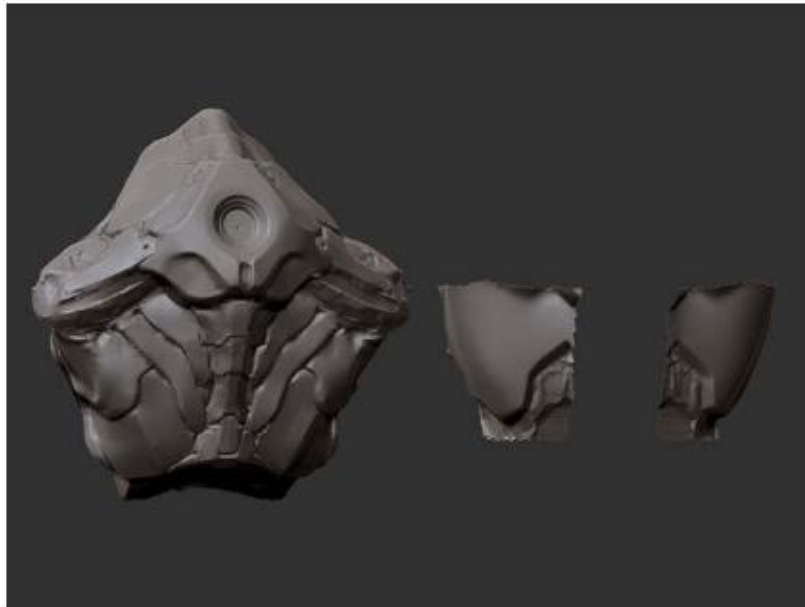


Illustration 4.27

I moved on to the upper lat area. Again I used mainly the hPolish brush in addition to the Smooth brush.



Illustration 4.28

At this point the back was starting to come together. While working on it I'm conscious to keep turning on and off the other subtools, to see how well they integrate into each other.



Illustration 4.29

The most difficult part of the back was definitely the upper back near the trapezius. At times I had to fight the mesh to get the look I wanted. I kept working at it however and it fell into place. It's fully done using the hPolish brush.



Illustration 4.30

Above is the final version of the upper torso. Many of the details have been left out at this point, but will be added after the entire retopology process.



Illustration 4.31



Then I moved on to the lower torso. The same low poly even-distribution principles were used to create this base mesh. I also capped the top and bottom of the base mesh. To do this, continue the retopology for the top and bottom. It's ok to be sloppy in these areas, since they will not be visible.

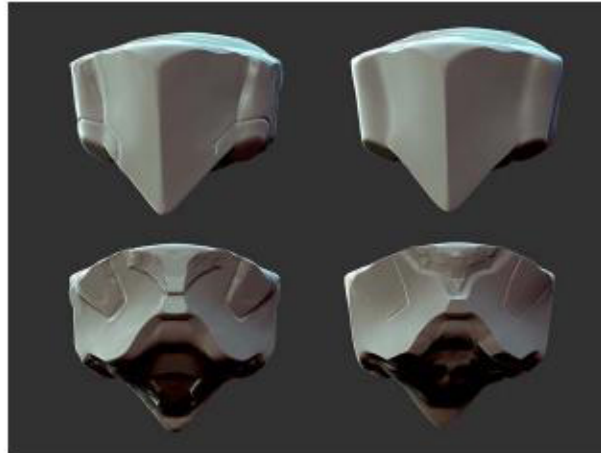


Illustration 4.32

I polished it out like the other pieces. At some point, I realized that the additions on the back would work better as a separate object. I outlined where they would be, and duplicated the mesh. Then I deleted the areas that would not be needed.

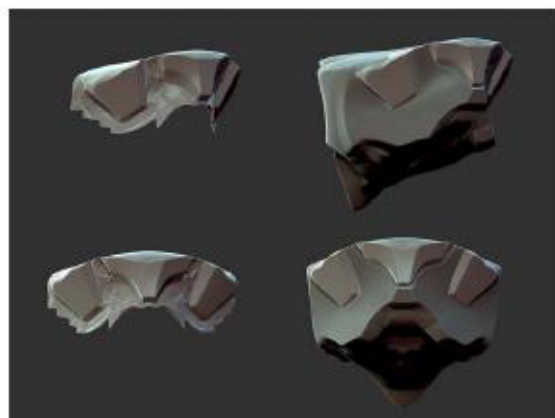


Illustration 4.33

Here you can see both meshes and how they integrate. The larger mesh's surface change really helps integrate the two together, making them appear that they functionally connect.

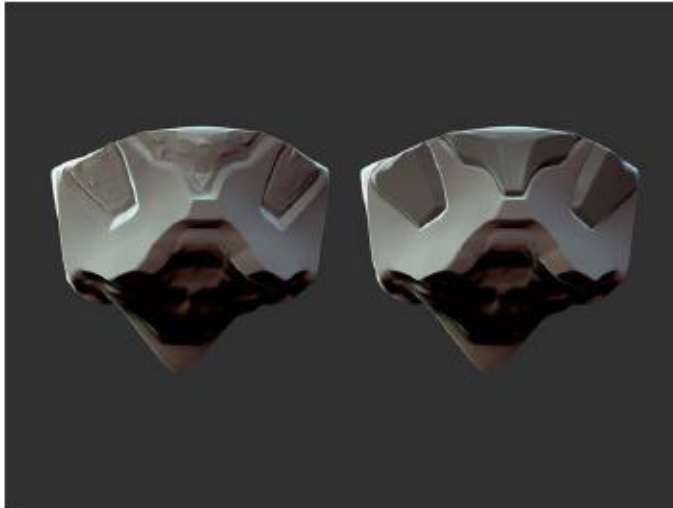


Illustration 4.34

I added a similar surface change to the outer protrusions in order to stick with one look and feel.

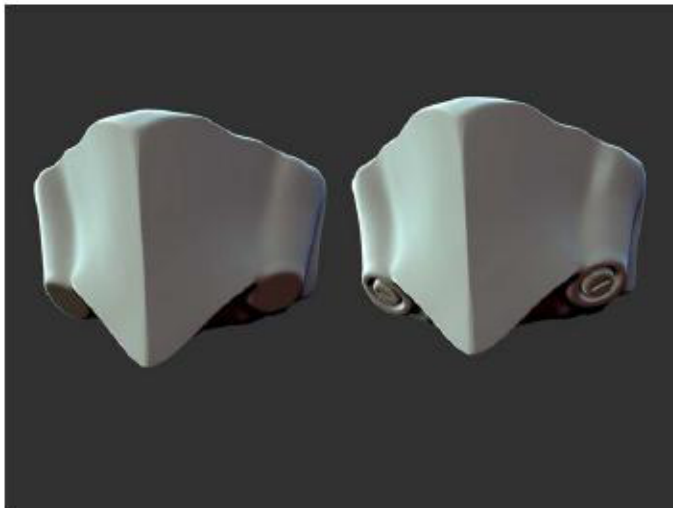


Illustration 4.35

Then I smoothed out the front a bit, and added an alpha decal.

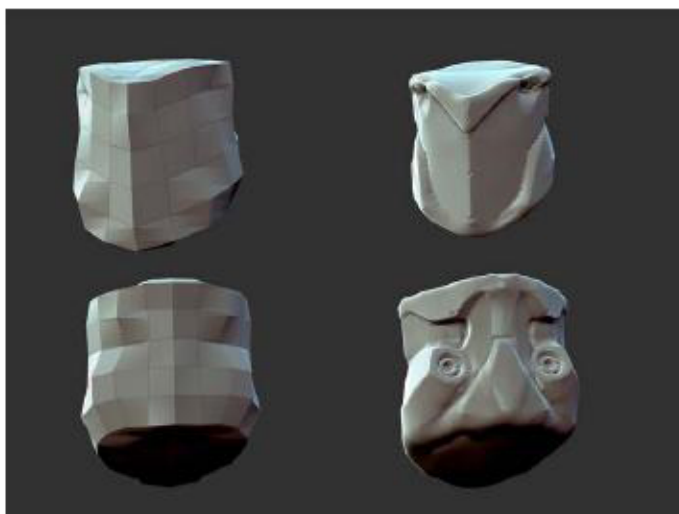


Illustration 4.36

Then I moved on to the lower torso

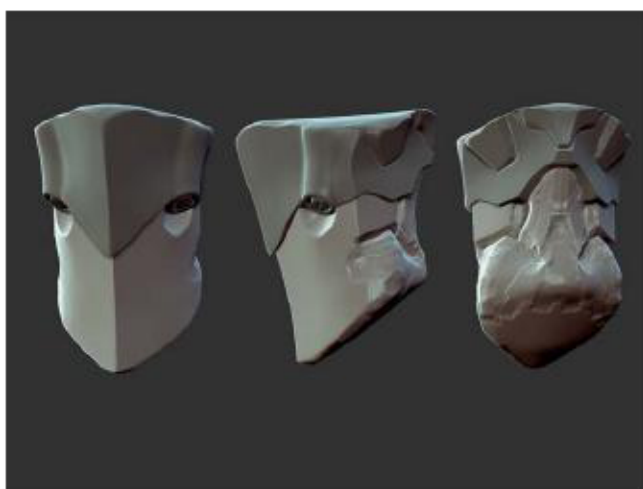


Illustration 4.37

The same process was used for this. Again I separated out parts that would be easier to deal with as separate meshes. I also appended the upper torso area to make sure the connection to each other was smooth.

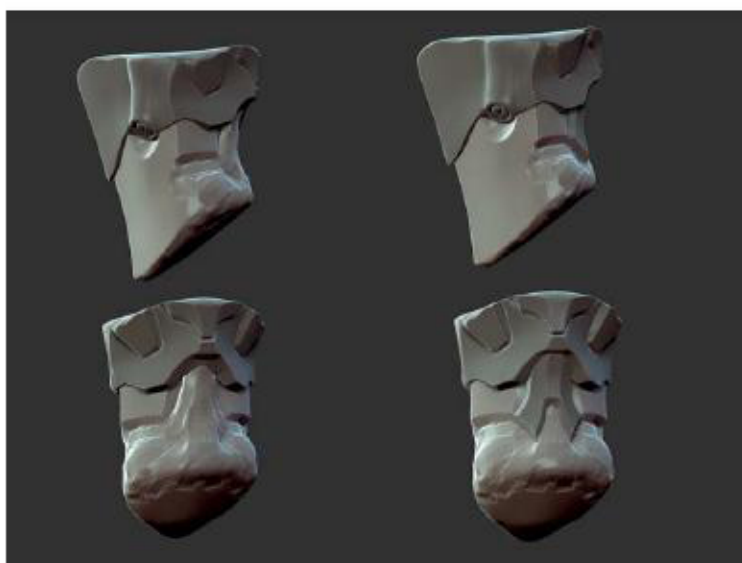


Illustration 4.38



Illustration 4.39

Here is the lower torso with all the pieces attached

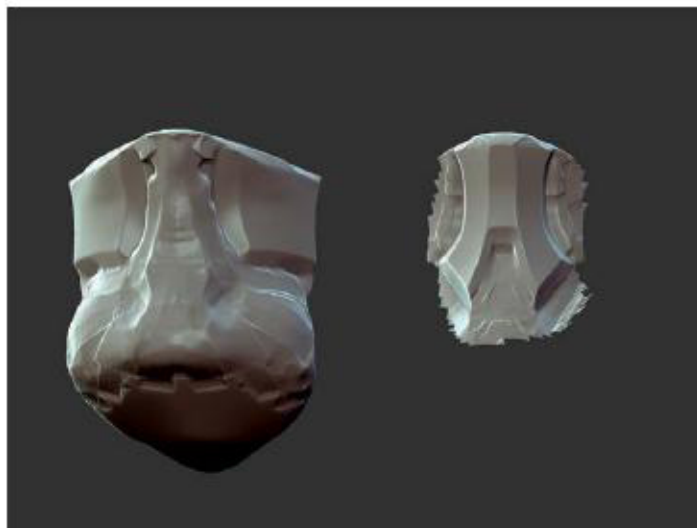


Illustration 4.40

Above is the two meshes separated out.

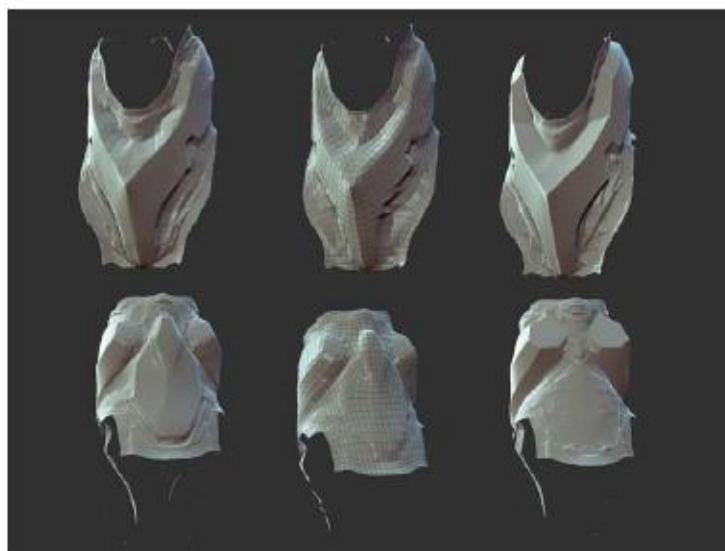


Illustration 4.41

Then it was time to move on to the hips. This form was a bit difficult to get correct. You'll notice that for this mesh I didn't cap the base mesh. It's not necessary to cap the base mesh, as long as the termination is hidden. It's important to keep in mind that mesh boundaries can be difficult to sculpt, so it's good to keep the termination far away from the necessary sculpting area.



Illustration 4.42

I used the layer brush to pull out a small cylindrical area on the back of the hips, to allow a better integration of an alpha stamp.

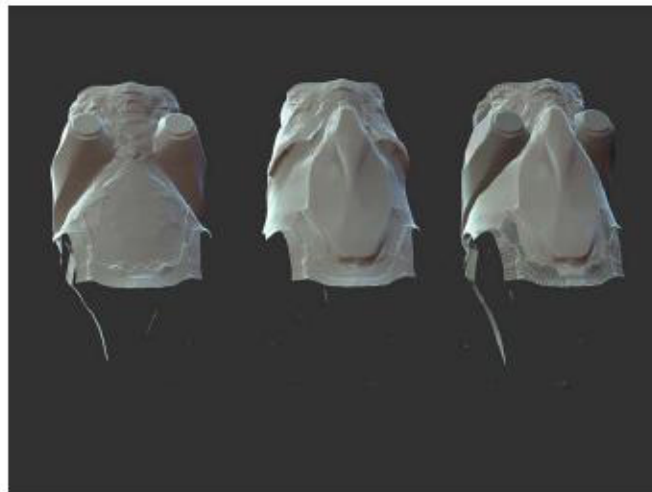


Illustration 4.43



Following the trend of the previous parts, I duplicated the mesh and cleaned that part up as well, making sure that it integrated with the rest of the subtools



Illustration 4.44



Illustration 4.45

Here is the entire lower torso together. Everything is integrated nicely and there are no holes in the mesh.

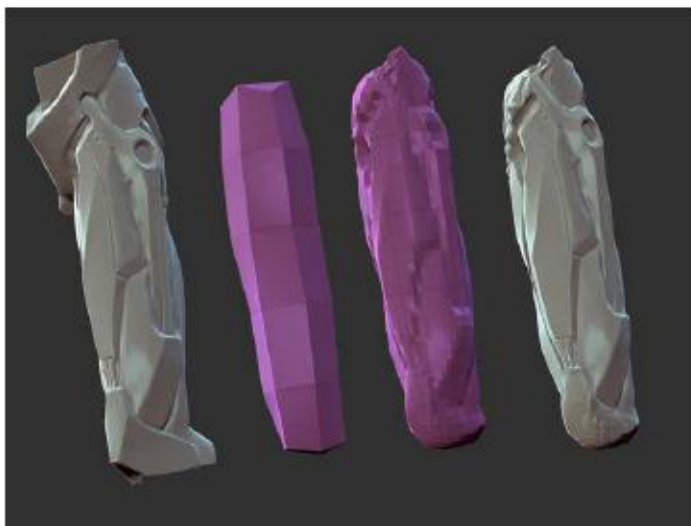


Illustration 4.46

It was then time to move on to the upper legs. I started with a low poly base mesh, and projected the details over.



Illustration 4.47

Then I started to segregate out the parts. This part of the leg is intended to be a metal structure, and as such should have very sharp and angular surfaces. For a lot of this mesh I used the planerFlatten and the planarTrim. These brushes allow the mesh to have perfectly straight areas.

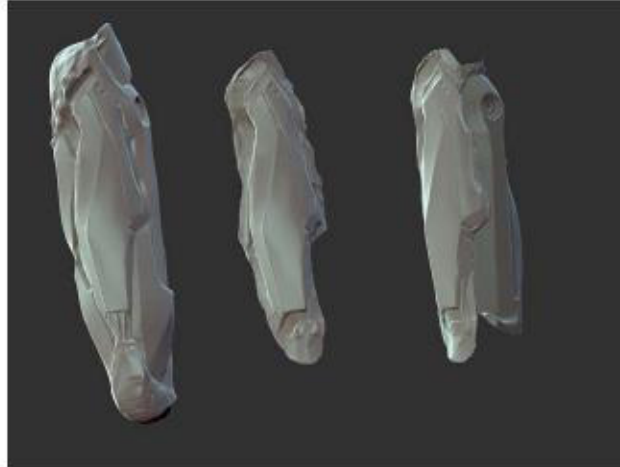


Illustration 4.48

On the outer leg I added placeholder details. In the end those will be erased and replaced with an alpha stamp



Illustration 4.49

I separated out the front of the leg and used hPolish to clean it up. You'll notice that I got rid of some of the details on it. They will be added back after retopology.



Illustration 4.50

I continued on to the lower outer leg. I modified the central contour a bit to give it more interest. All of this was done using the hPolish brush.



Illustration 4.51

I tuned on the other subtools and used the clayTubes brush to push in the surfaces that were conflicting with the other subtools.



Illustration 4.52

Then I moved on to the back of the legs. These two meshes are very simple. Minimal hPolish was required to clean them up and integrate them into the rest of the leg.



Illustration 4.53

Above in Illustration 4.53 are the two pieces that contribute to the inner leg. They were both finished off using hpolish.



Illustration 4.54

Then I added the piece that connects the legs to the hips

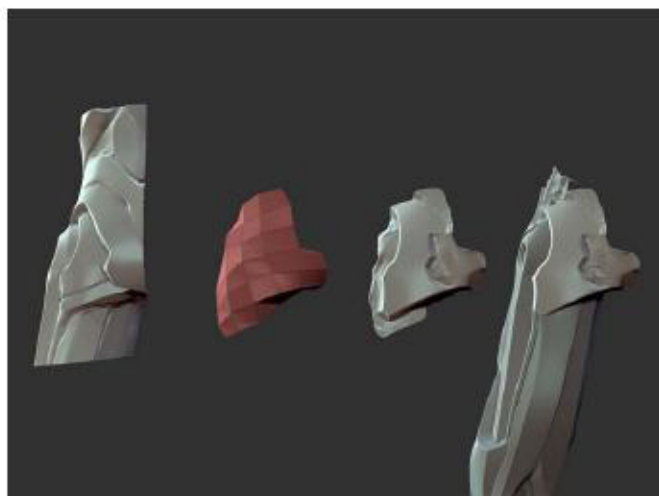


Illustration 4.55

I then moved on to the buttocks. Notice again that I left out details left over from the initial sculpt. I wasn't too satisfied with the detail in this area, so I planned on revamping it.

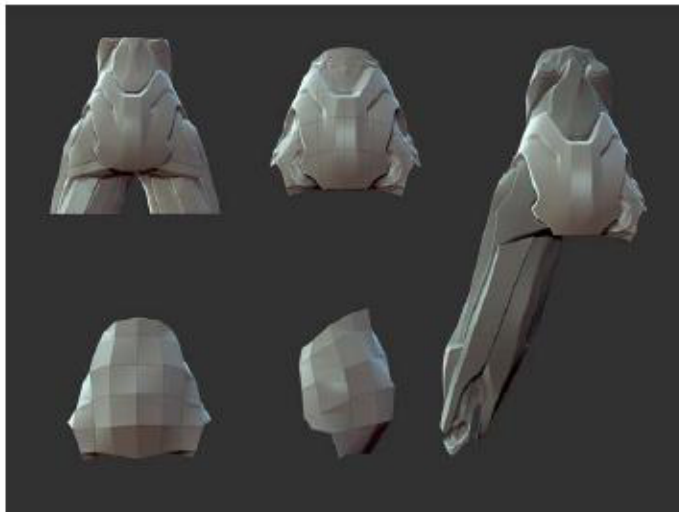


Illustration 4.56

I finished off the buttocks with the center piece, making sure it fit comfortably between all the other pieces.



Illustration 4.57



I imported the hips to make sure that everything meshed well. Notice that I have yet to mirror both the legs and the arms. That will not be done until the details are added.



Illustration 4.58

Then it was time to move on to the lower legs. At this point I was not happy with the feet, so they would be completely redone. Here I made the base mesh and projected everything over.



Illustration 4.59

I continued on to the pieces of the lower leg, starting with the easiest.



Illustration 4.60

Then I moved on to the back. Since the process is so repetitive, I've compressed this a bit. Above is an exploded view of the back of the leg.



Illustration 4.61

Finally I made sure all of the pieces fit together.



Illustration 4.62

One of the hardest parts was making the upper leg, lower leg, kneecap, and under armor all fit together. To start off I imported both the upper and lower legs into one tool Ztool.



Illustration 4.63

I started off with the base mesh of the kneecap. I wanted to modify the shape and make it appear more angular.

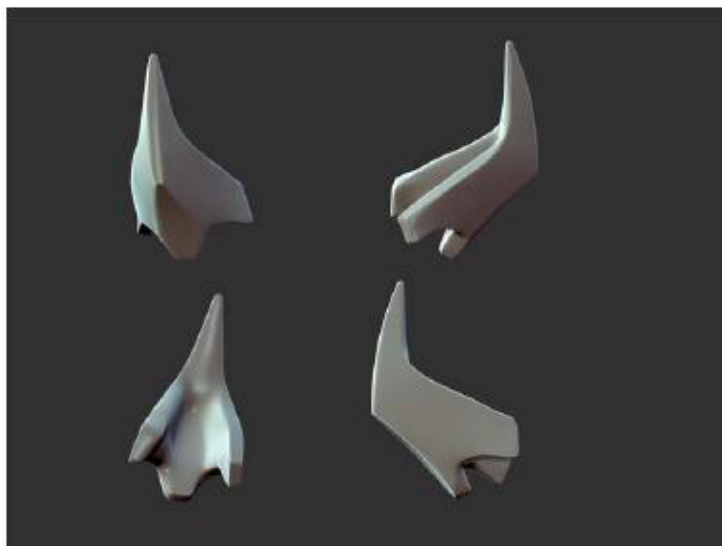


Illustration 4.64

I started using the hPolish brush to define surfaces and corners.



Illustration 4.65

I started reaching the shapes I was looking for when I created a flat front and top for the kneecap.

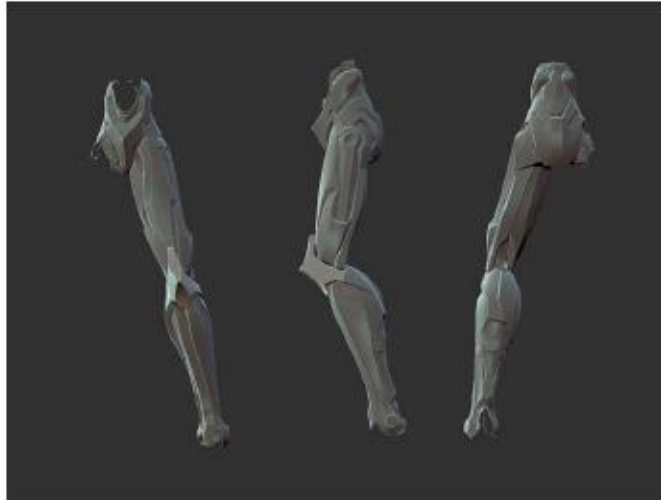


Illustration 4.66

Thus far everything looks good. When I turned on all of the subtools I noticed a mesh termination was visible on the outer lower leg where it met with the kneecap. The fix was to simply use the Move brush to pull it up into the kneecap.



Illustration 4.67

I then went on to create the under armor.



Illustration 4.68

I subdivided it and make it fit in the upper and lower legs using the clayTubes brush to elevate and relegate the mesh. Once it was in place, I used the smooth brush to make everything look rubbery. I then used the inflate brush on the edges where the under armor met the other subTools, to make it appear that it was bulging at the fringes.



Illustration 4.69

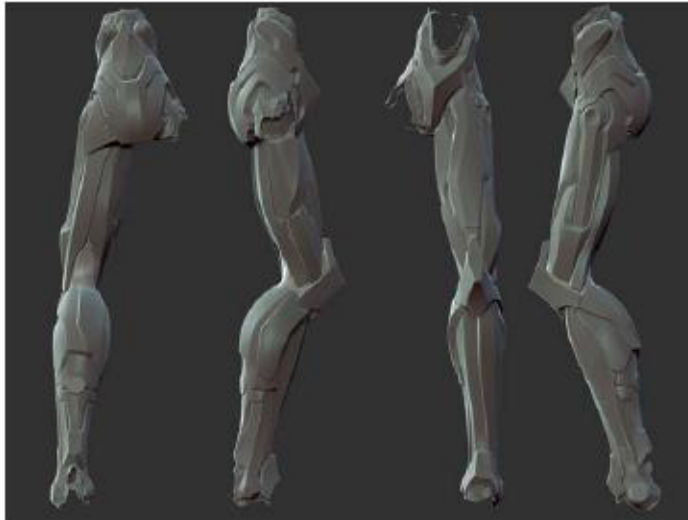


Illustration 4.70

Above seen in Illustrations 4.69 and 4.70 is the final version of the leg, sans the visible mesh termination.



Illustration 4.71



Then I moved on to the helmet. For the helmet there were five major pieces to construct.



Illustration 4.72

I started with the most visually prominent piece. I used hPolish in both positive and negative values to create the hard corners.



Illustration 4.73

I then moved on to the mid helmet using the same technique.

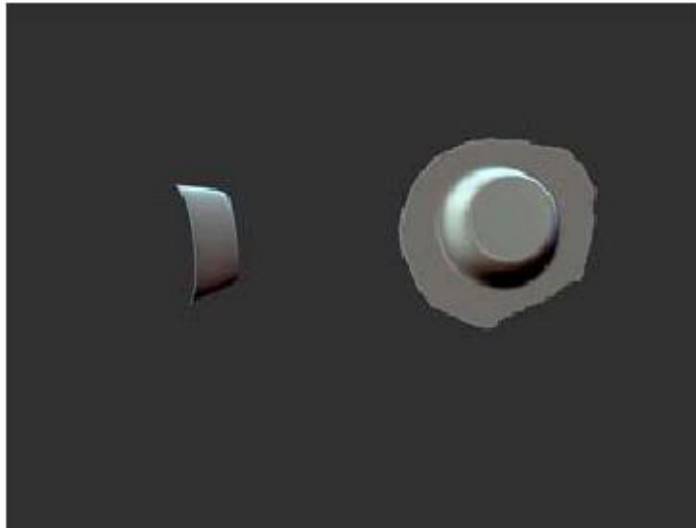


Illustration 4.74

Here is the earpiece. This is the only piece I didn't project. It was easier to simply use the trimHole brush to pull out a fast circle. I then capped off the circle with the hPolish brush to make sure everything was clean.



Illustration 4.75

Here I made sure that they all fit well together.

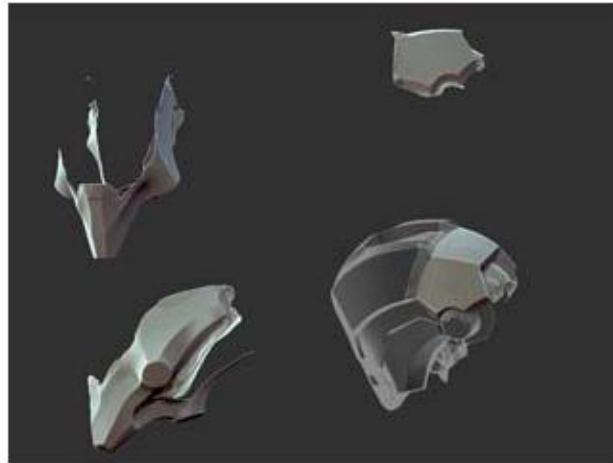


Illustration 4.76

Then I moved on to the lower helmet and the rear of the helmet. They were created using the same technique of the hPolish brush in both zadd and zsub.



Illustration 4.77

Here is the final look of the helmet without any of the details.



Illustration 4.78

I then used a custom made alpha to stamp on the eyes.



Illustration 4.79

The details on the back of the helmet use the same alpha as the eyes. To create the difference Zsub was used when placing them.

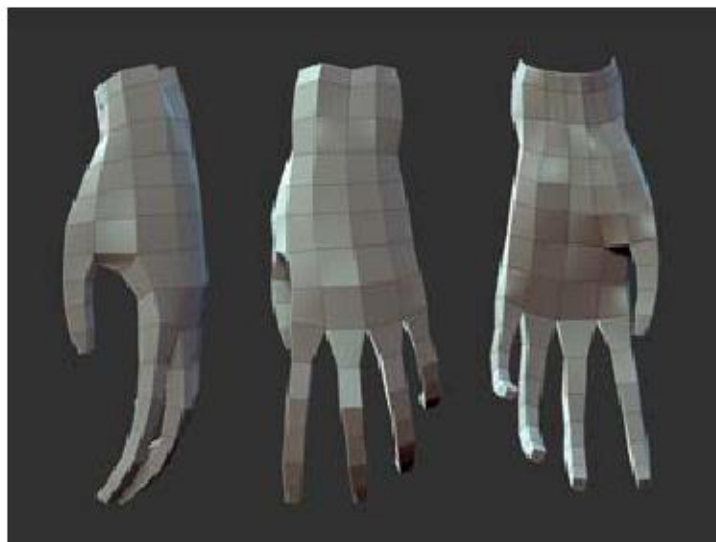


Illustration 4.80

I imported several pieces of the forearm to make sure that everything would integrate correctly.



Illustration 4.81

I started playing with different ideas, although I had a good idea of the direction I wanted to take it.



Illustration 4.82

I started sculpting the thumb using the clayTubes brush, trying to define a shape for all the fingers.



Illustration 4.83

I then went onto the index finger. One look I knew I wanted was to have the joints appear bulky, while the flanges appear relatively thin.



Illustration 4.84

I continued to use the clayTubes brush to build up the surface. It's a good idea to change materials often to see how different lighting setups affect your mesh.



Illustration 4.85



Since I wanted each joint to have metal parts, I knew that they would have to be separated. Here I used the dam\_standard brush to cut in the areas I wanted to separate.



Illustration 4.86

Then I started interchanging the clayTubes brush with the smooth and hPolish brushes to try to clarify the idea.



Illustration 4.87

In the image above the thumb is starting to take shape. The areas to be segregated are clearly defined, and have more defined forms.



Illustration 4.88

Once I felt like the overall contours felt right, I went in with the hPolish brush for some heavy duty cleaning.



Illustration 4.89

I then did the same thing for the index finger. To separate the rubbers on the inner hand I used the dam\_standard along with the pinch brush.



Illustration 4.90

Since I didn't want to sculpt the same finger over and over, I felt it would be easier to project each finger with a slightly different size and pose. Thanks to Project All I was able to do this with little difficulty.



Illustration 4.91

I placed the finger to be projected on top of the finger I wanted to receive the detail.



Illustration 4.92

I then used the standard and move brushes to try to get the undefined finger to fit well within the detailed finger. This ensures that all the polygons will be evenly distributed for the projection.



Illustration 4.93

Above in Illustration 4.93 is what the finger looked like finally projected.



Illustration 4.94

Once I had all the fingers projected, I had to do marry them to each other. I used the clayTubes brush to build up the surfaces and the hPolish brush to clean them up and make them appear to flow together.

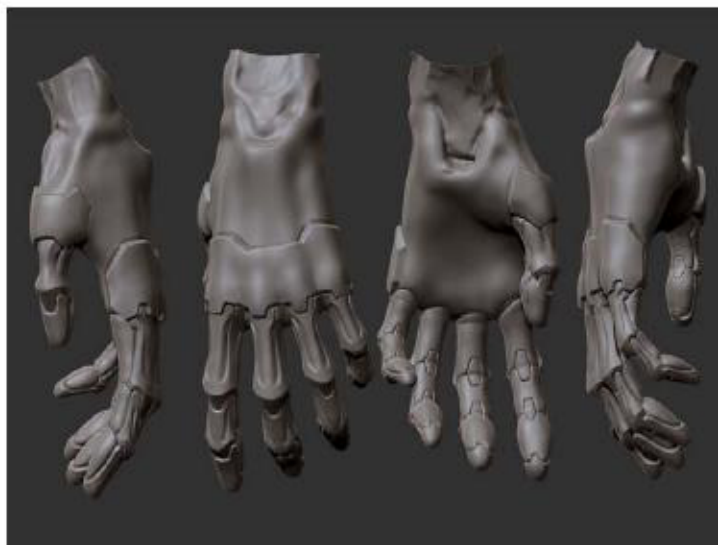


Illustration 4.95

The other part of the hand is essentially done at this point.



Illustration 4.96

The next step was to make sure that the hand and the forearm connect correctly. Once I had everything in place I used the hPolish brush to create hard edges.

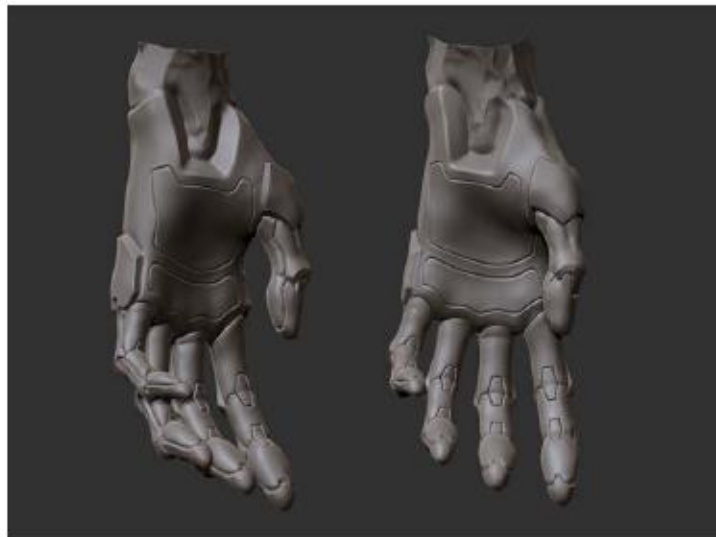


Illustration 4.97

Then it was time for the details of the inner hands. To create these outlines I used the dam\_standard brush to cut into the mesh, and then pinch to tighten the lines up.



Illustration 4.98

I used the same brush to create the diagonal strokes within the palm. Then I used the inflate brush on a very low setting to elevate each strip and give it a more padded feeling.



Illustration 4.99



Then I used the standard brush with drag dot to add grips to the hand.



Illustration 4.100

Above in Illustration 4.100 is the final version of the hands.



Illustration 4.101

Since the neck had not been previously defined, I separated it out visually first.



Illustration 4.102

Then I went in to retopologise, and break it into 3 major parts.



Illustration 4.103

Above is the final version of the neck. I used the inflate brush where each neck piece met with another mesh. This helped sell the idea that they are connected together, rather than intersecting meshes.

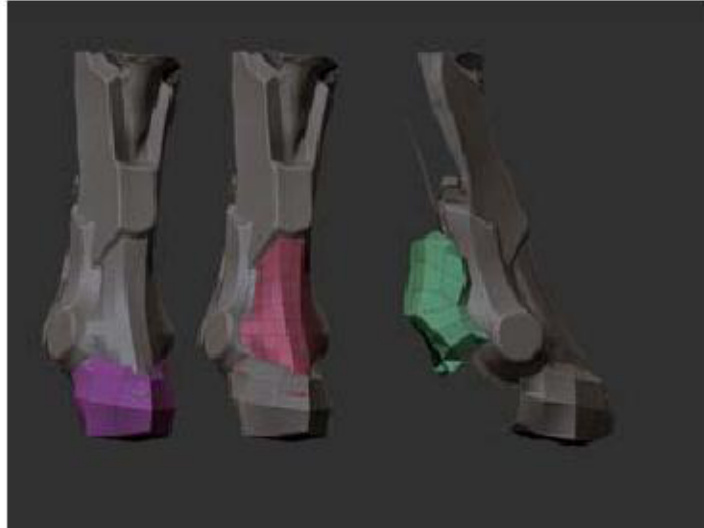


Illustration 4.104

Finally it was time to work on the feet. For this area I used a different approach and instead decided to create a base mesh for each piece I decided to separate.



Illustration 4.105



Illustration 4.106

After projection, I started using the clayTubes to build up and cut away shapes.



Illustration 4.107

The top of the foot is mean to have a rubbery feel, to make it appear that the toes have the ability to bend. As such I made this area very soft and smooth.



Illustration 4.108

I then used the dam\_standard bush to cut in seams to the area. At this point the retopology process is complete. Then it was time to move onto alphas.

## Chapter

# 5

## Creating Stamps

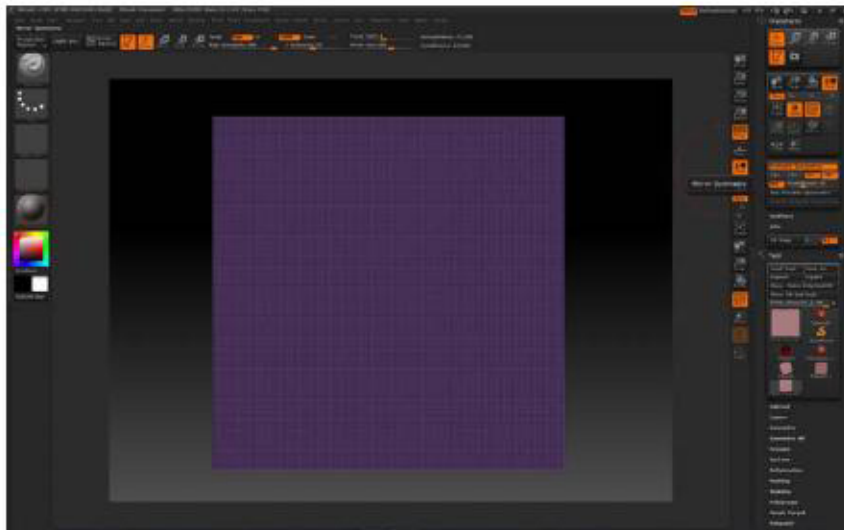


Illustration 5.1

I started off by drawing a plane3d onto the canvas as seen in Illustration 5.1

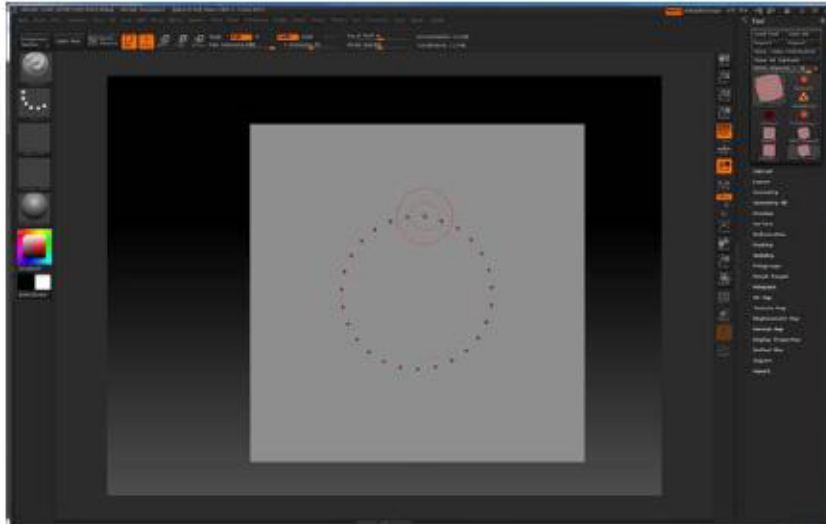


Illustration 5.1

After turning it into a polymesh3d, I activated radial symmetry in the transform menu. The closer you are to the center, the closer you are to the center of the mesh the lower the RadialCount you should use. Since I'm fairly far away I used a medium number.

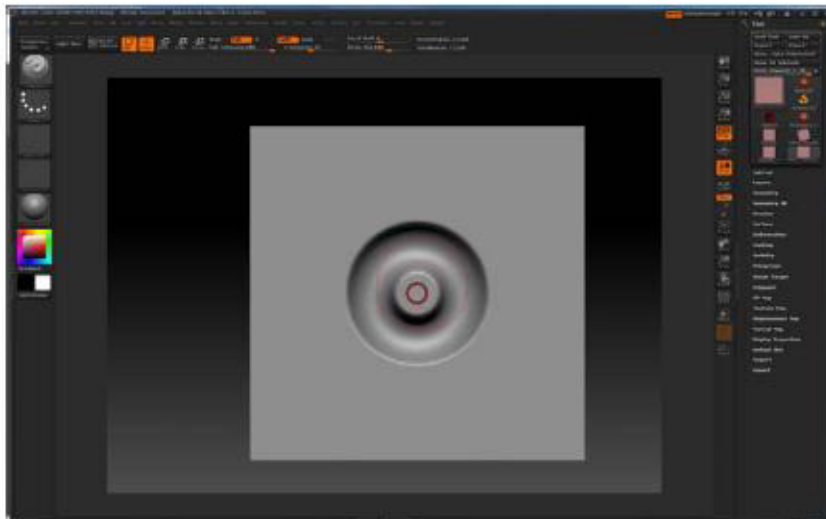


Illustration 5.3



Then I used the standard brush to dig a hole for the alpha. As seen in illustration 5.3

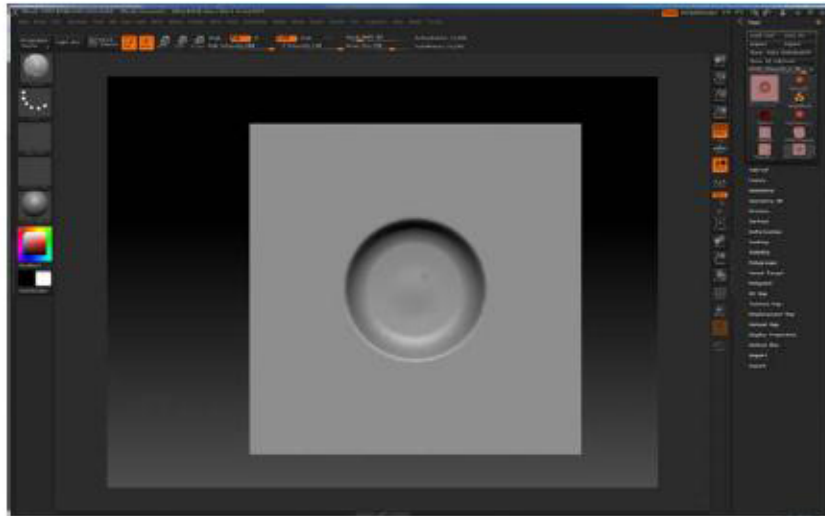


Illustration 5.4

Then I push the left over area in the mesh down. You can use any brush for this, but I used the clayTubes brush

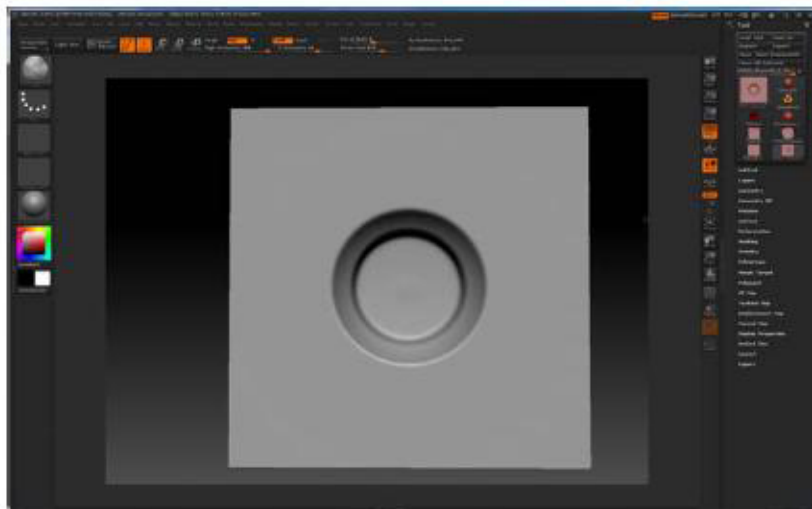


Illustration 5.5

I then used the clay brush to push the center straight back.

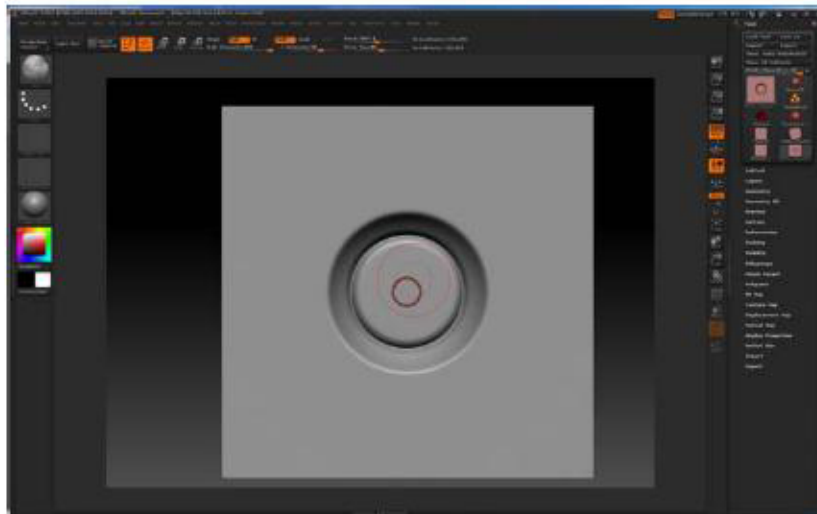


Illustration 5.6

I use the clay brush once again to pull it back out again. I also smoothed the edge of the inner circle to soften it up a bit

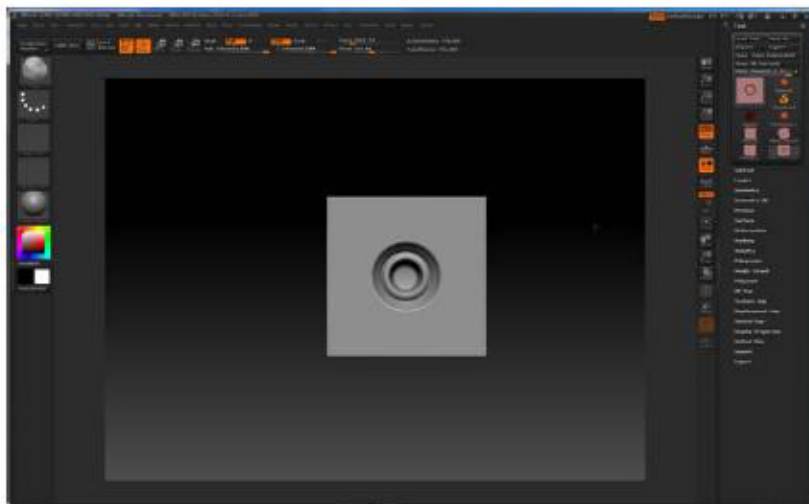


Illustration 5.7

Finally I cut a hole in the center

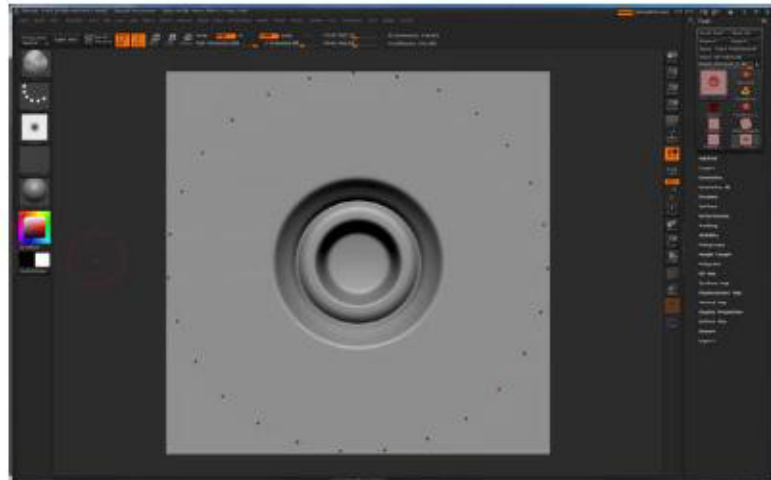


Illustration 5.8

Above is the finished result. To make the alpha, the document must be square. I recommend using 512 by 512 pixels, since you generally won't need a higher resolution than that. Then frame the model with the "F" hotkey, and zoom a little bit to make sure the mesh is extended a bit past the document size. Then press the GrabDoc button from the alpha palette. I changed the brush to standard, and the stroke type to DragDot

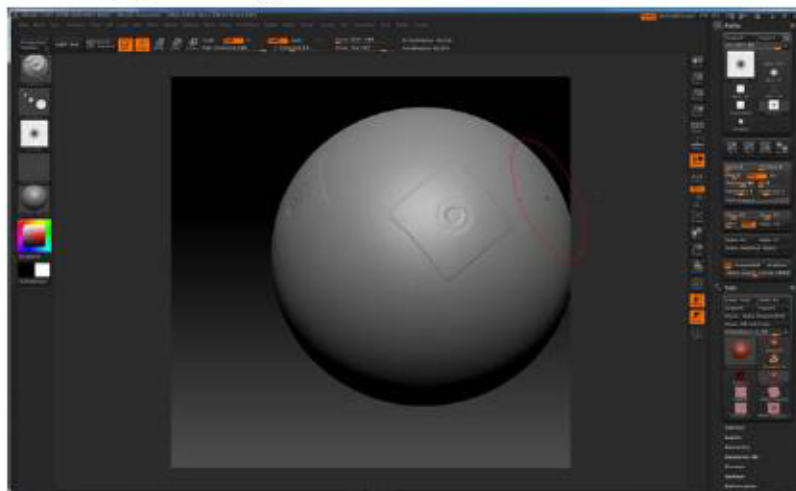


Illustration 5.9

Above is initially what I got. There are a few things I needed to fix. First of all, the intensity was very soft. To fix that I simply turned up the intensity on the brush

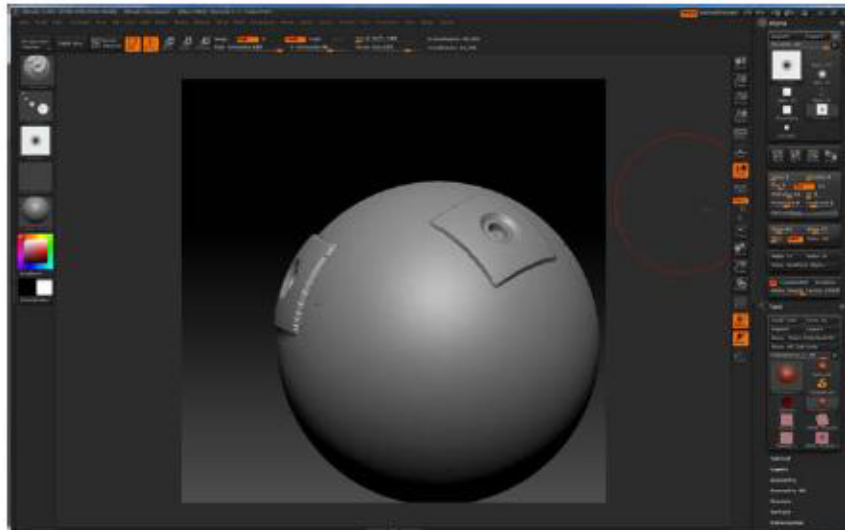


Illustration 5.10

After playing around with it a bit I found an intensity that worked well. The second thing to notice is that the alpha causes edges to be extruded along with the mesh. This is because the white areas on an alpha will add to the mesh while the black areas will remain the same. We can modify this to choose the zero-point of the alpha. For example, if I 50% gray, then white would elevate the mesh, while black would relegate the mesh. This modification is done in the alpha palette using the MidValue slider. For this particular alpha I changed the MidValue to 100 because I wanted the white areas of the alpha to remain where they are, while I want black to pull in. Since this particular alpha's white areas need to be zeroed out, I could have simply inverted the alpha. This is not the case for all alphas.

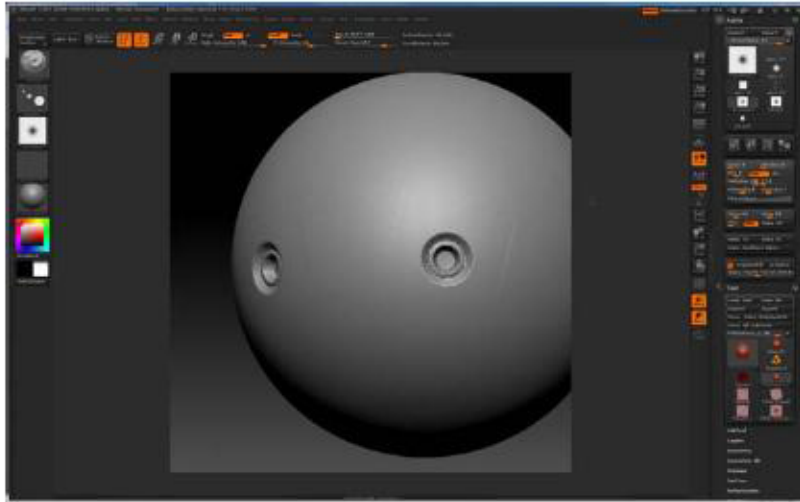


Illustration 5.11

The brush was almost there at this point. The edges are still noticeable. To fix that, I simply change the focal shift, so the alpha falls off before it reaches the edge. For this brush the focal shift is negative70.

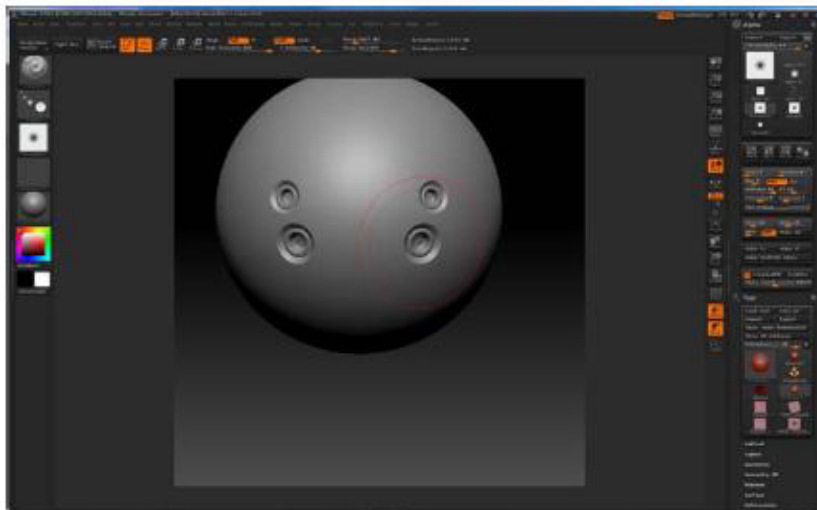


Illustration 5.12

After a bit more testing, the brush worked perfectly.



Illustration 5.13

Above is the final look of the alpha.

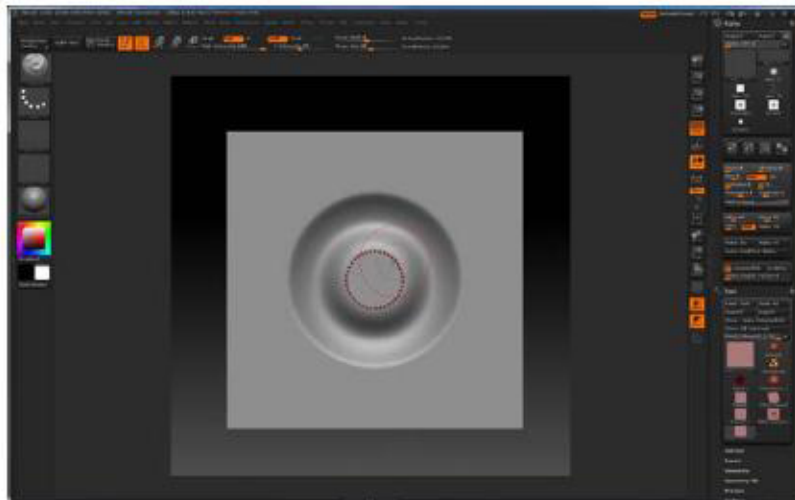


Illustration 5.14

For my second alpha I used a similar process. I started by cutting the boundary with the standard brush.

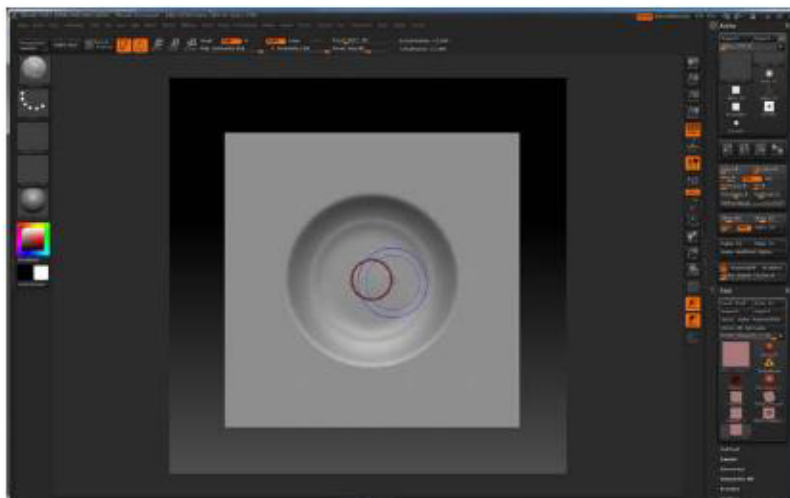


Illustration 5.15

Then I flattened the inside to the same level using the clay brush.

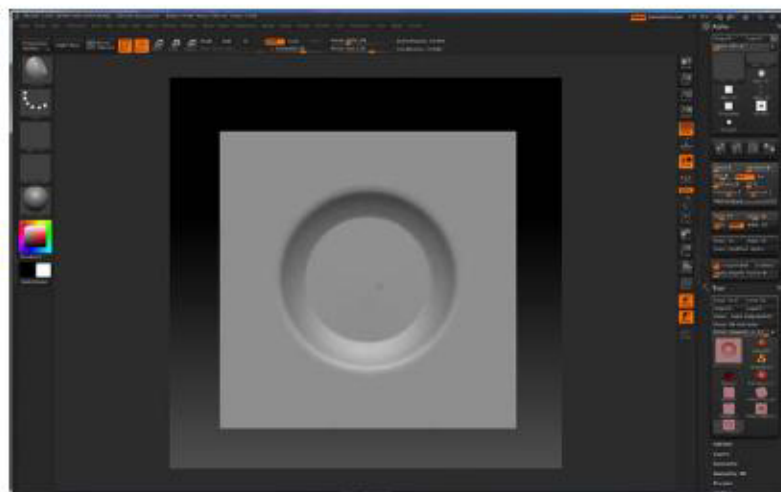


Illustration 5.16



I then used hPolish with Zsub to pull out the center and flatten it out a bit more.

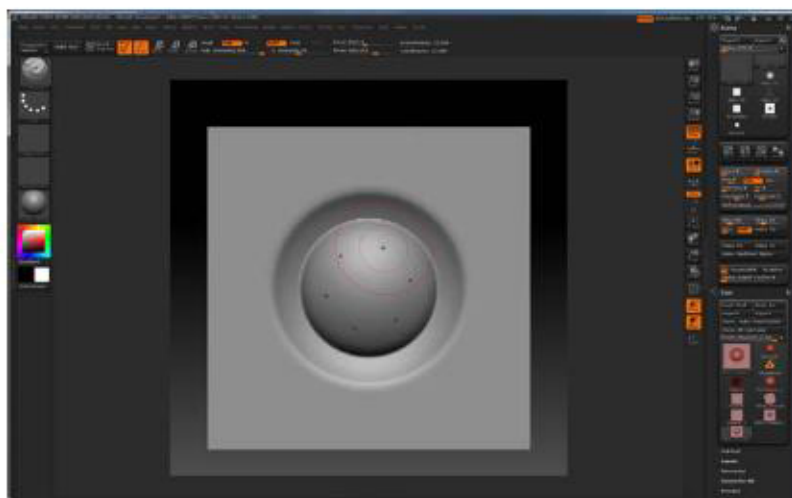


Illustration 5.17

I wanted a rounded effect, so I used the standard brush, and pulled out the center of the mesh.

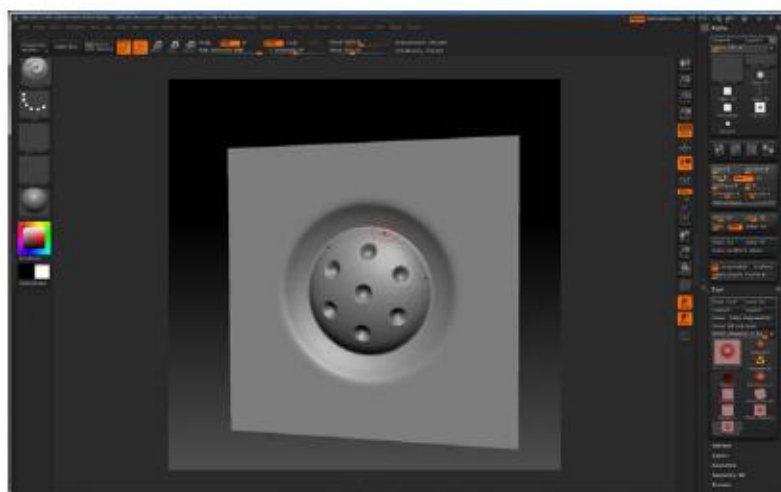


Illustration 5.18

I then changed my radial count to six and added a few holes using the standard brush. Then I used turned off symmetry and added one final hole to the center.

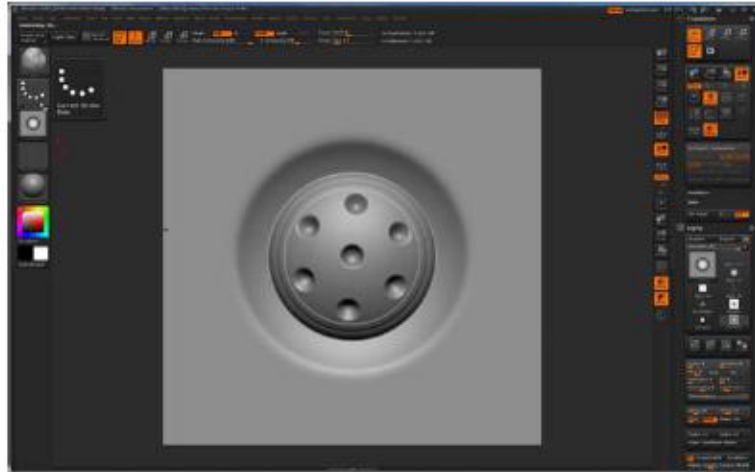


Illustration 5.19

Using the same process I grabbed the alpha and edited the intensity, focal shift, and MidValue until it integrated well into other meshes.



Illustration 5.20

Above is the final result of the alpha.

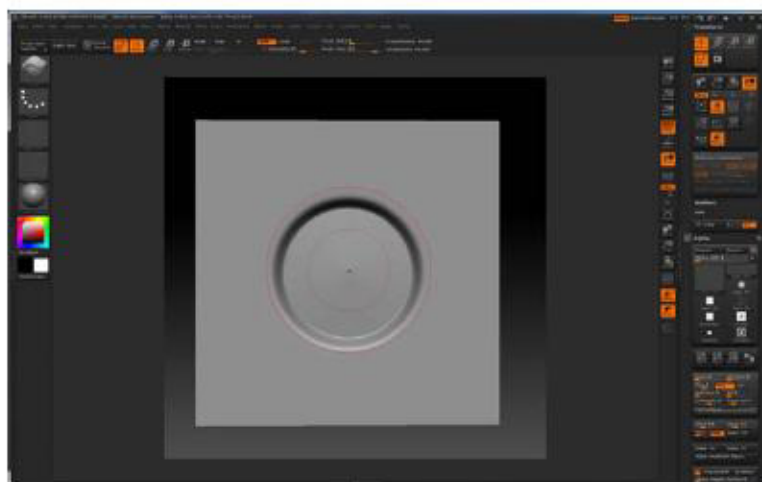


Illustration 5.21

To start off this alpha, I used the layer brush

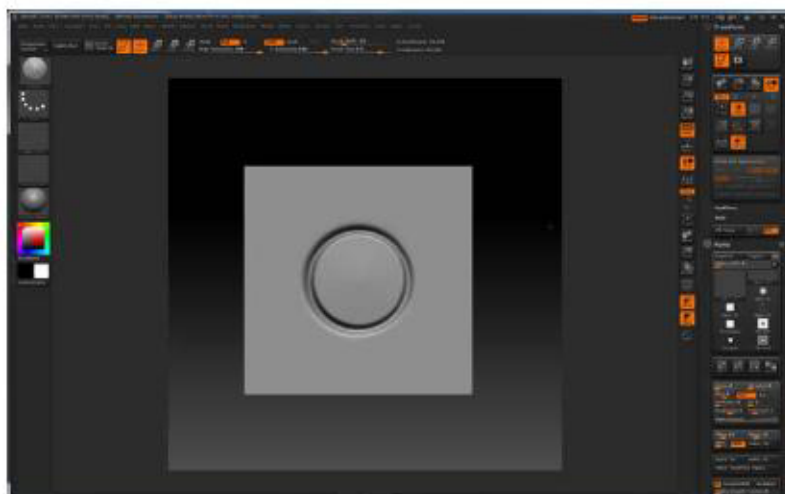


Illustration 5.22

Once I pushed it back I pulled it out again to roughly the same height

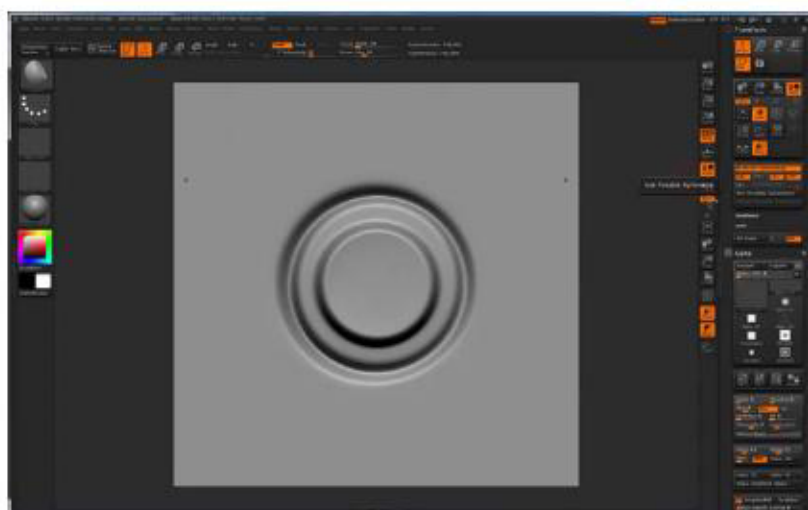


Illustration 5.23

Using the layer brush I added another extrusion on top

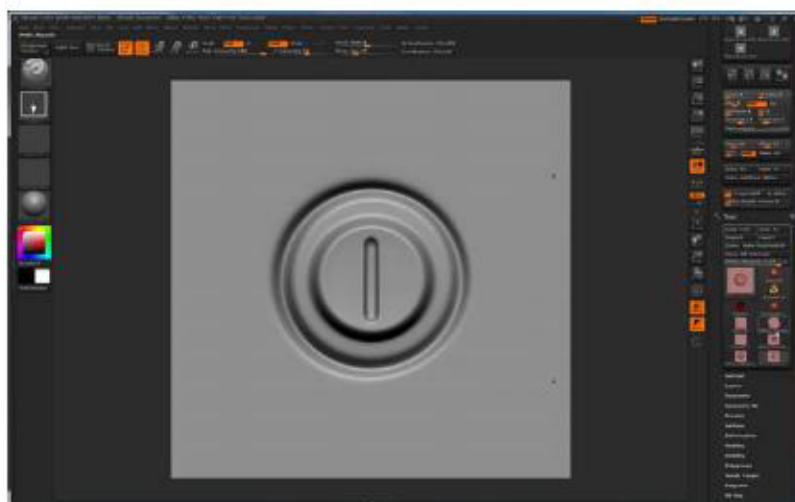


Illustration 5.24

Finally I used the standard brush to cut a line through the center



Illustration 5.25

Above is the completed alpha.

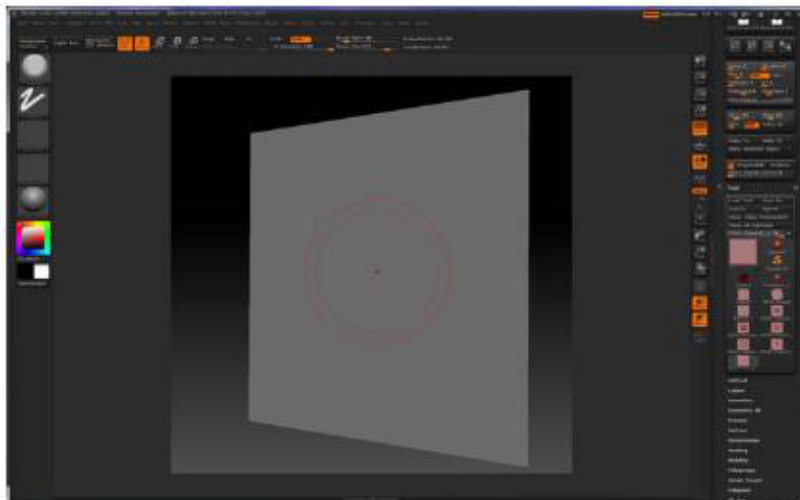


Illustration 5.26

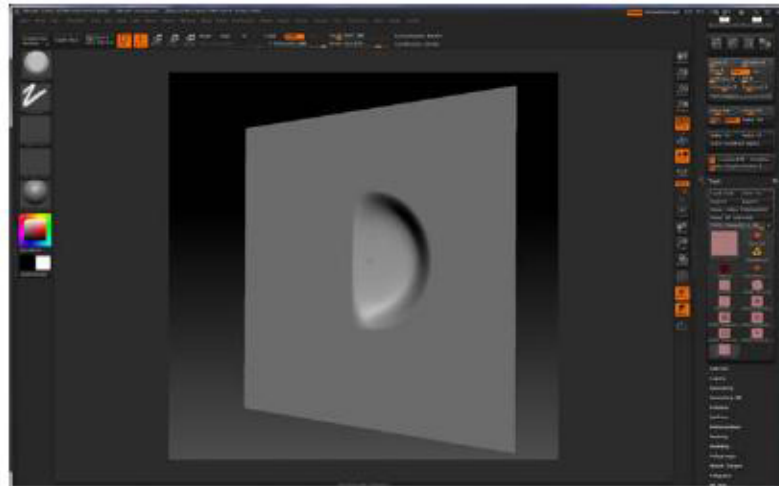


Illustration 5.27

For the next alpha I wanted to create an angled screw port. To do this I rotated the plane, and used the TrimHole brush to cut half a circle in it. TrimHole is based on the camera's normal, so the angle that you rotate the plane will determine the angle of the brush cut.

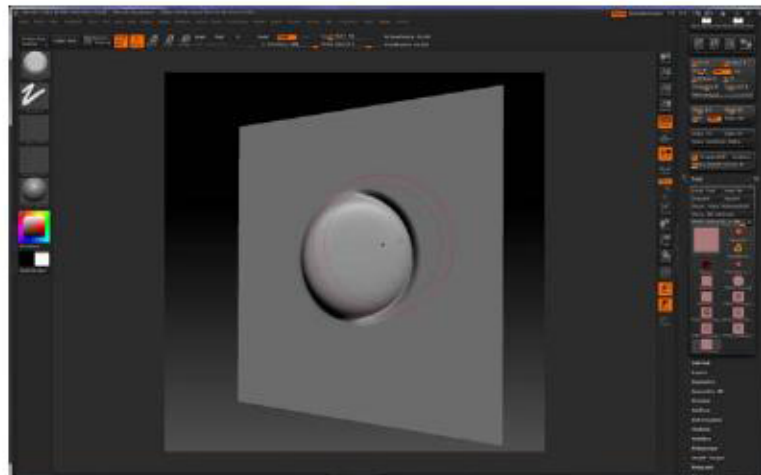


Illustration 5.28

Then I used the brush with Zsub to pull out a full circle.

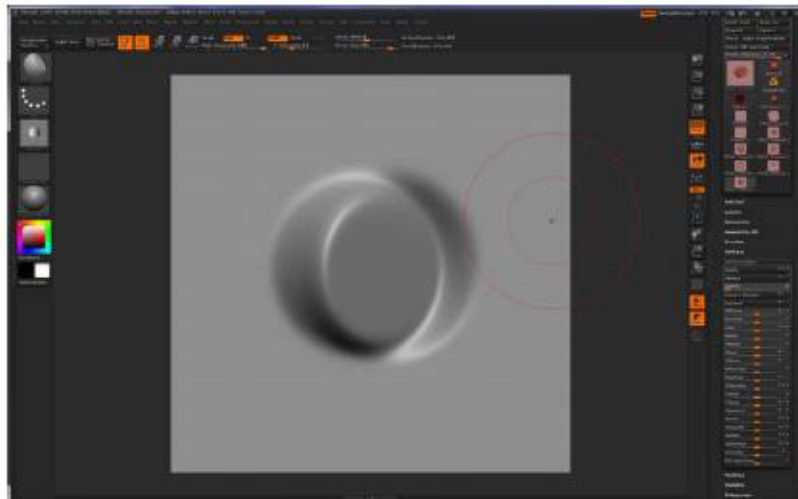


Illustration 5.29



Illustration 5.30



Above is the result of the alpha used in conjunction with a simple circular alpha.

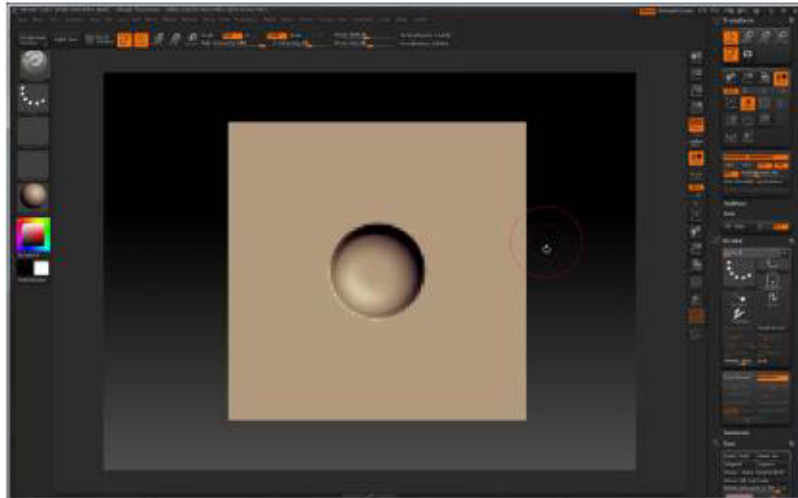


Illustration 5.31

For the next alpha I wanted to create a repeating circular pattern. I started by creating a hole in the mesh.

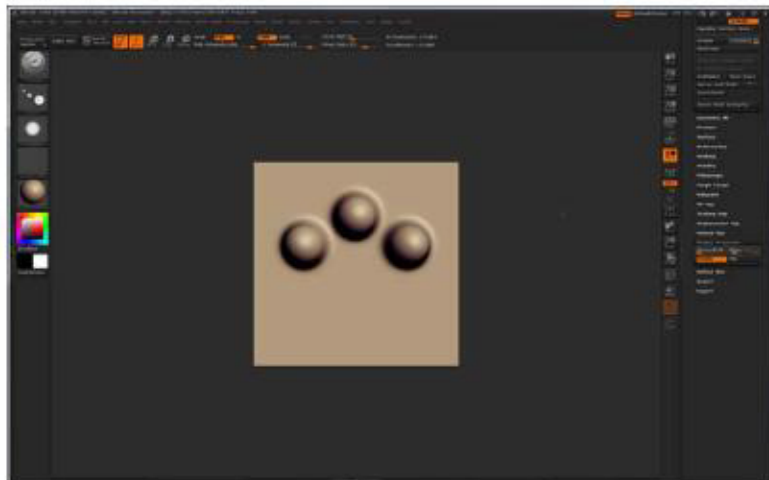


Illustration 5.32

I then stamped that pattern in three areas.

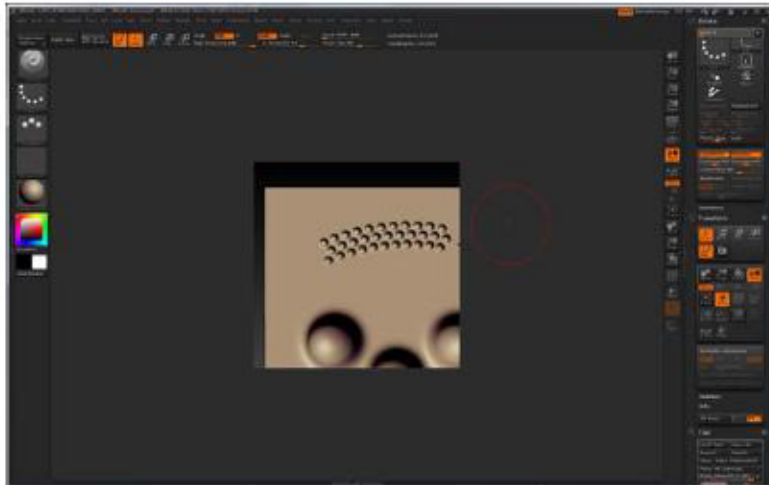


Illustration 5.33

I turned on left the stroke type on Dots and turned on LazyMouse. I played with the LazyStep settings until the spacing looked like the above.



Illustration 5.34

Finally I went onto the back alpha. This alpha needed to be unique and stand up well, since it would occupy a large portion of the upper back. I started like usual and carved a large hole using the standard brush.



Illustration 5.35

I then added another hole using the layer brush

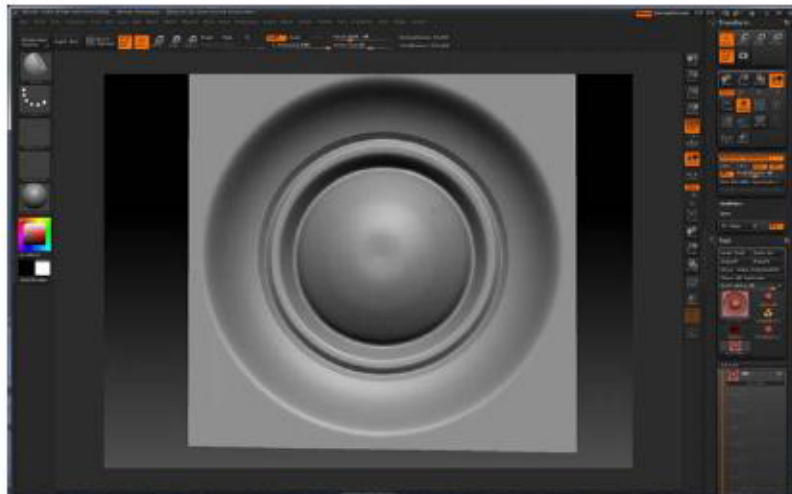


Illustration 5.36

Using the same techniques as the previous alphas, I pulled out a large spherical area using the standard brush, and added a few details.

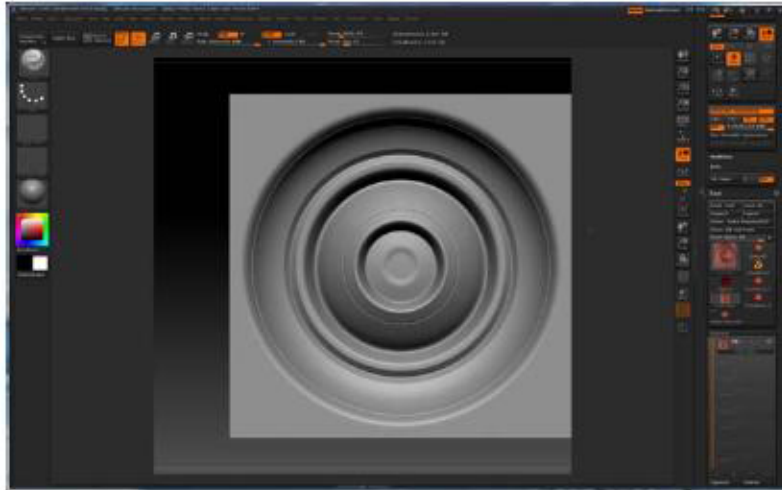


Illustration 5.37

I continued to push in and pull out until I reached the mesh in the above image. More small details have been added at this point

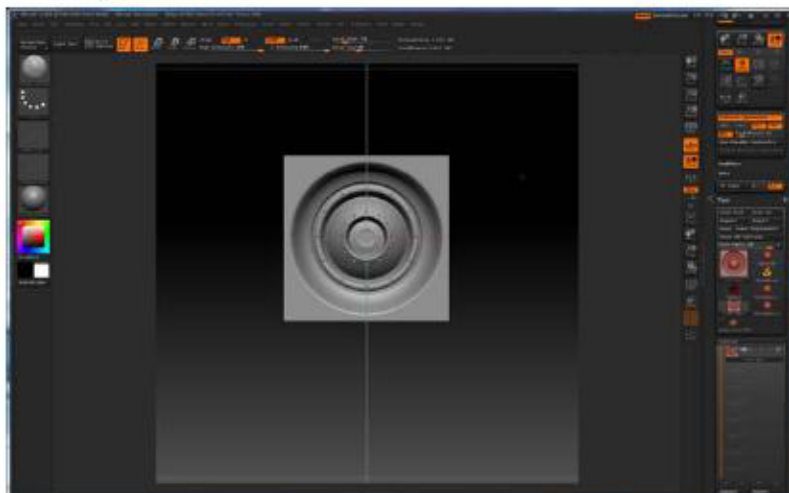


Illustration 5.38

Eventually this is the alpha I came up with. I used one of my previous alphas to add rivet holes to the mesh

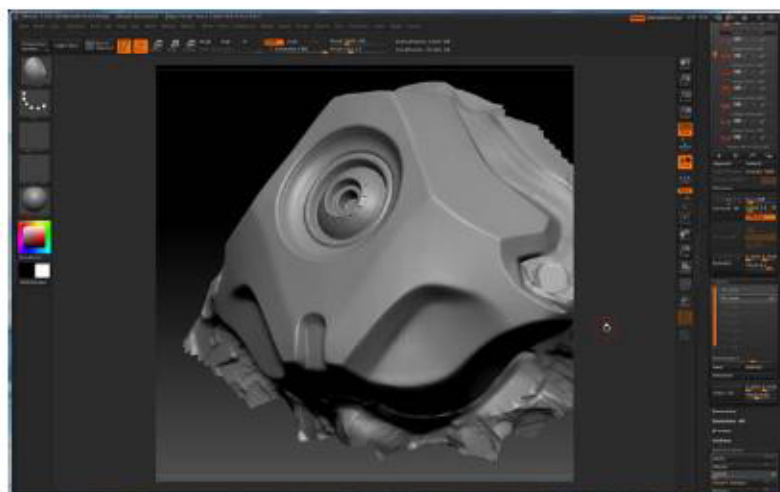


Illustration 5.39

Then I stamped the mesh with the alpha

## Detailing the Character

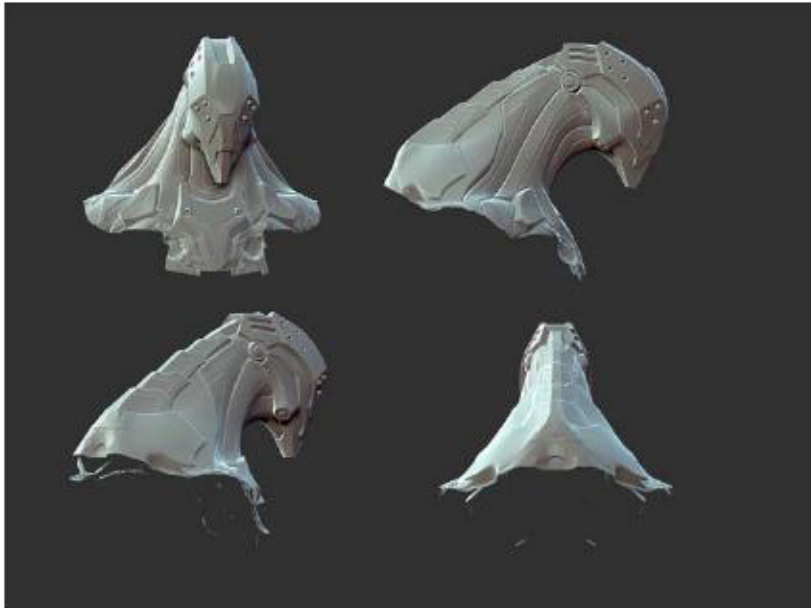


Illustration 6.1

After I was satisfied with the stamps I had, I began to add details. Almost all of the details were added using either the `dam_standard` brush to cut lines, or my new alpha brushes created for stamping. This is the simplest process in the sculpting phase. Notice on the neck I used the repeating alpha with a very low intensity.

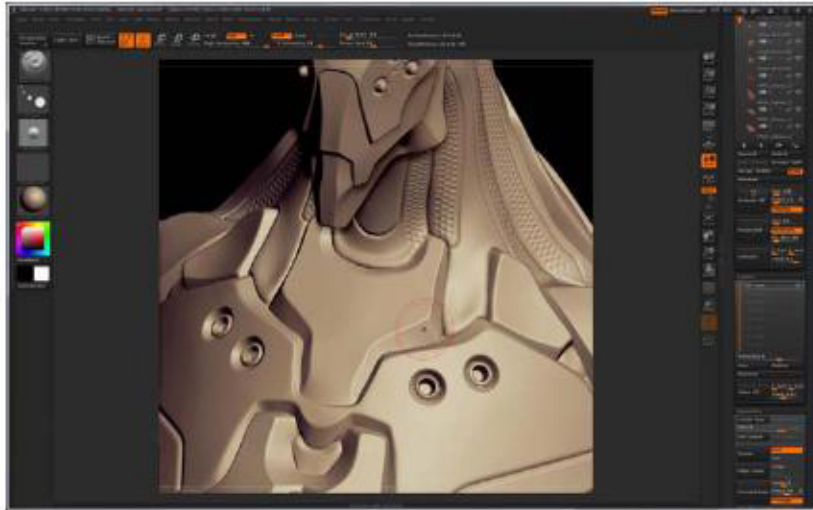


Illustration 6.2

I'll use one of the neck pieces to illustrate the process

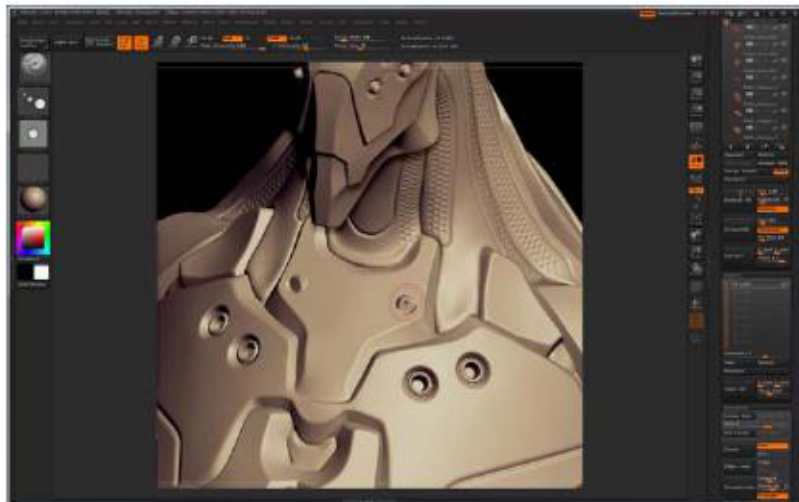


Illustration 6.3

First I used my new stamp brush to add screw ports to the piece.



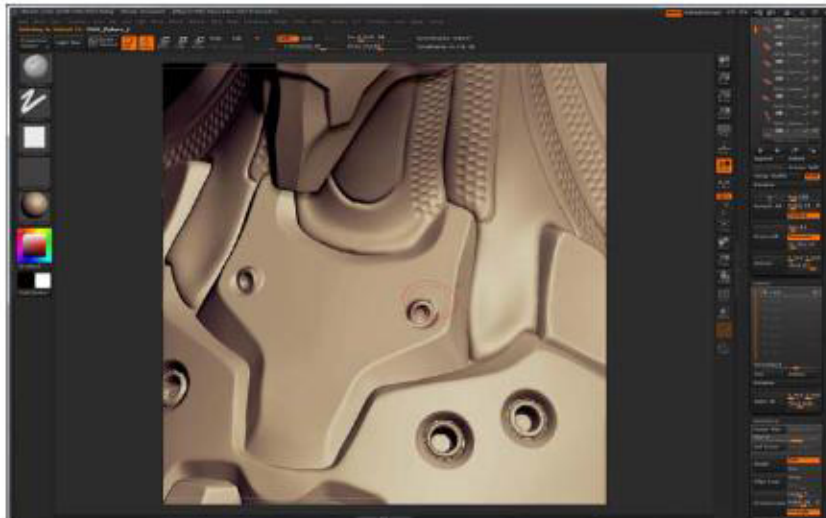


Illustration 6.4

I added a few holes using a simple circular alpha to add the hole for the screws to enter.

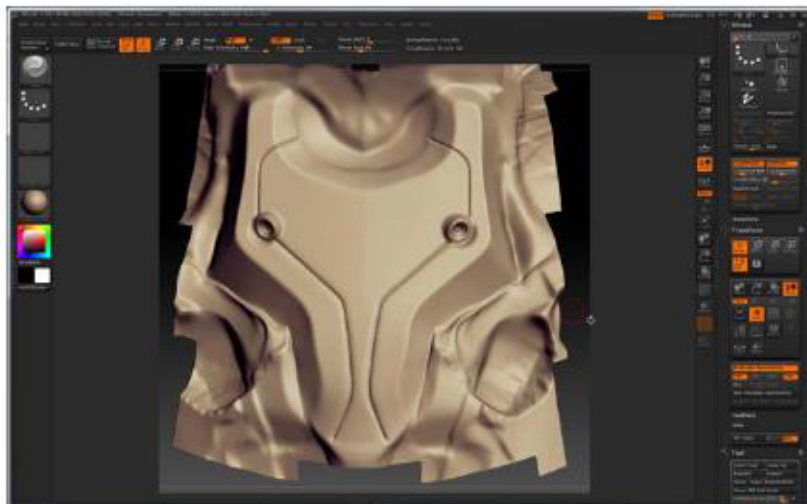


Illustration 6.5

Then I used the dam\_standard brush to cut a line to make it appear that the center piece was screwed into the other.

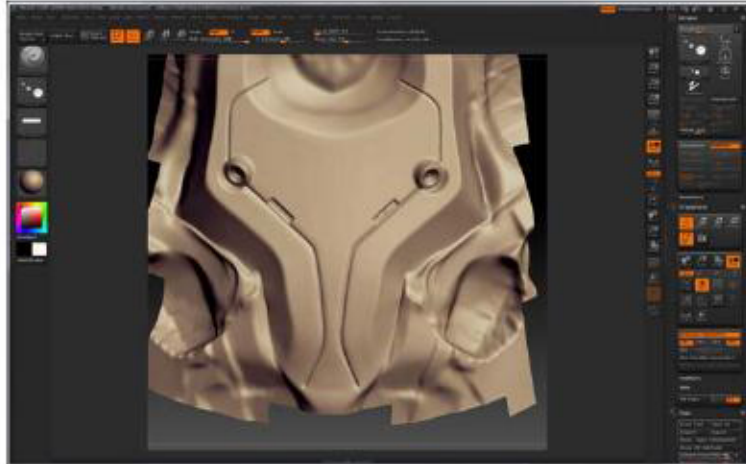


Illustration 6.6

Finally I added a simple rectangular stamp in Zsub. In reality these two “holes” in the inner plate would make it easier to remove as there is room to either grip them or wedge a piece of metal in between the two areas to separate them. It’s a little touch that adds a lot of believability.



Illustration 6.7

I used the same process for the rest of the torso.

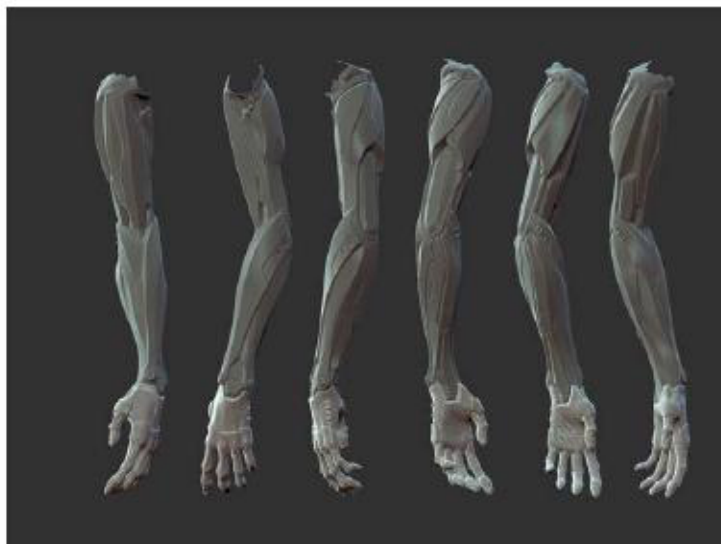


Illustration 6.8

Above is the completed arm. Again the details were all created using the same stamp brushes and the dam\_standard tool.



Illustration 6.9

Once I had all the pieces finished individually, I compiled them together into one Ztool, and made sure they integrated well.

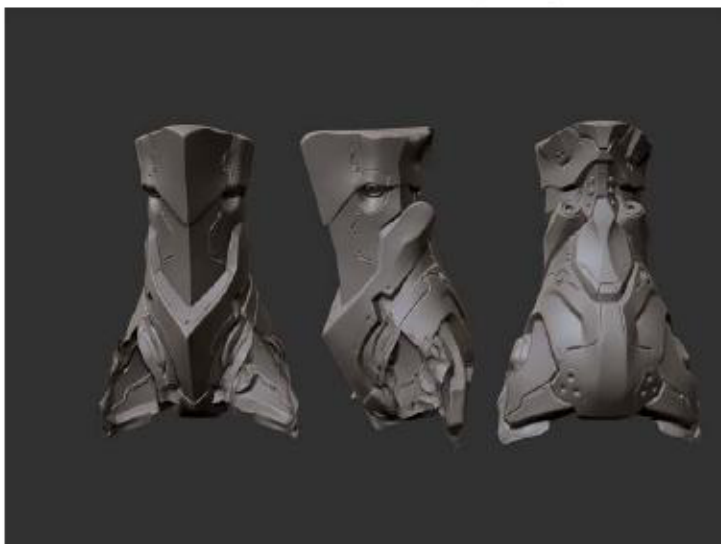


Illustration 6.10

Above is the finished version of the lower torso and hips. All the details you see were created using the same alphas and the dam\_standard brush.

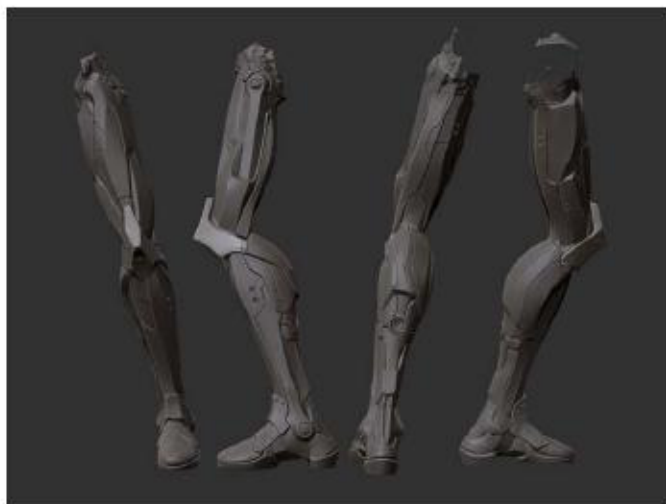


Illustration 6.11

I finished the legs off using a similar process. It's important when adding details to disperse them sparsely. A model with too many details will not give the viewer specific areas to focus on and will be noisy. In this case less is more.



Illustration 6.12

Above is the final, non-posed model. Now that everything fits well together it's time to pose it.

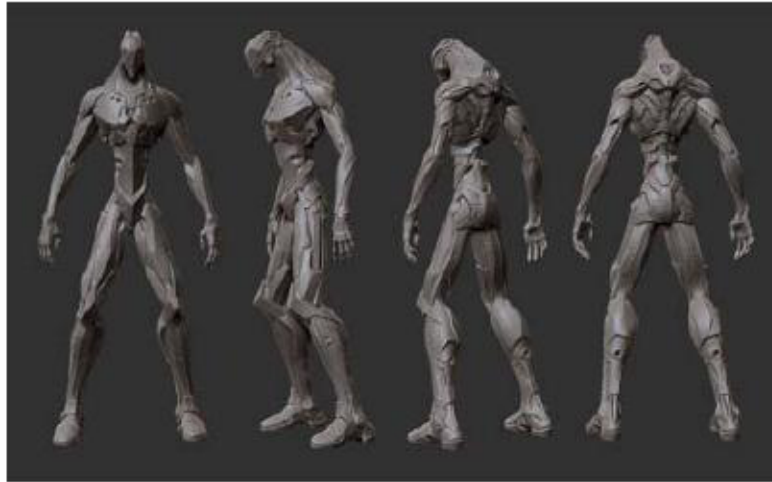


Illustration 6.13

Making sure I had a lower poly version of all of the subtools, I used Transpose Master to pose the mesh



Illustration 6.14

Above is the final posed mesh. I wanted to create a default asymmetric pose just to give him a bit of life.



Illustration 6.15





Illustration 6.16

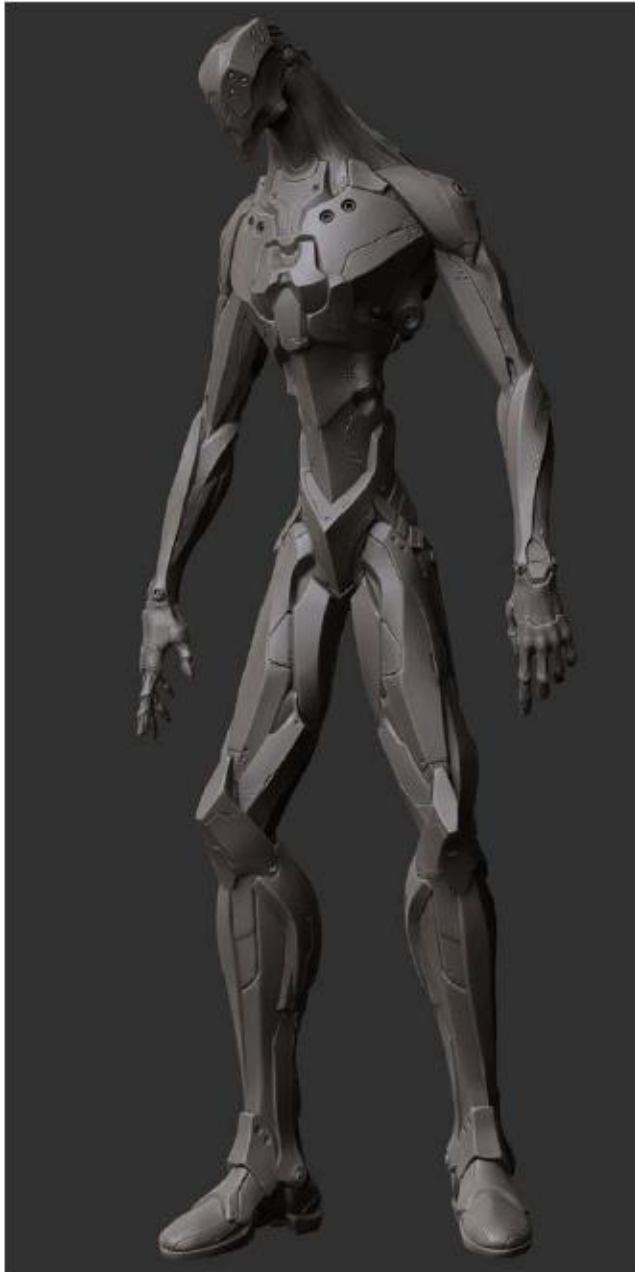
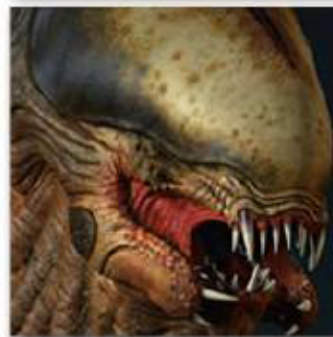
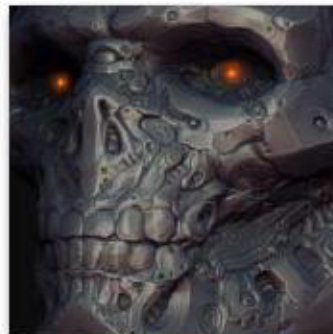


Illustration 6.17

## Invited Artist Gallery

The Invited Artists Gallery was an idea originally brought up early on in the discussion of what the book should ultimately be about. I contacted the following artists since I had admired their work located on [www.zbrushcentral.com](http://www.zbrushcentral.com) for some time. These are true artists worthy of recognition.

**Calum Andrews, Furio Tedeschi, Joe Deangelis, Greg Strangis**



# Calum Andrews

I'm a 36 year old Londoner living artist by night, and business management by day. Father of two amazing children and still with my love, Caroline, 18 years now since we got together. My 2 year old girl Staffordshire Bull Terrier is the other love in my life!

## **Location**

London England

## **Website if you have one**

[www.calum5.com](http://www.calum5.com)

## **Skillset**

3d character /creature modeller,Fantasy ,Gothic an Sci-fi artist.

## **How long have you been doing this?**

8 years as a hobby.

## **What programs do you use?**

Zbrush,XSI,Poser,Bryce,Photoshop,

## **How did you get started?**

Always enjoyed drawing creatures and when I discovered computers and the tools available to help it all began for me.

## **Who has been an influence on your style / skill?**

Just my own history to my knowledge,maybe unconsciously films may have embedded something..

**What is your favorite Work to date?**

Im not happy with much I do. Even my fav pieces are far from where I'd like them to be. Zira is one I like the most to date.



**What projects are you working on now?**

I'm currently working on 2 Album covers (German) and some 3d models for a Hong Kong based firm.

**What tips / or advice would you give to people just starting out?**

Just plug away and you'll find your way. Look at magazines and websites, see what you like and research how it was done. Then practice your life away!





Thank You to Calum – you are an inspiration and I look forward to seeing more from you.



# Furio Tedeschi

## **Location**

South Africa

## **Website if you have one -**

### **Sketches –**

<http://www.zbrushcentral.com/showthread.php?t=69054>

### **Portfolio –**

<http://blaze.cgghub.com/images/>

<http://ft.cgsociety.org/gallery/694658/>

## **Skillset**

Technical Artist, Lead Artist but Characters have always been my interest

## **How long have you been doing this?**

about 10 years now

## **What programs do you use?**

Zbrush, mudbox, 3dmax, Maya, Photoshop

## **How did you get started?**

After art school I did a small 3d course which introduced me to 3d max and Photoshop

## **Who has been an influence on your style / skill?**

Well plenty guys ...but my parents always had Frazetta books and pictures round the house from a very early age I recall being in awe of his work.

## **What is your favorite Work to date?**

hmmm too many too say

## **What projects are you working on now?**

Hooking up a small studio of artists called "Creature Bites" will be up and running soon



**What tips / or advice would you give to people just starting out?**

My experience generally being at the right place at the right time – there is always a opening in a studio just keep practicing and if you keep at it you will get your foot in the door.





Thank you Furio – you are an awesome artist. Good luck on the “Creature Bites”!

# Joe Deangelis

I attended Vancouver Film School where I received a diploma in 3d animation and visual effects, at this time I also met my wife Rosalie. She is the best wife any man could ask for and has helped me through my journey to becoming a character artist. I have always had a passion for film, video games, art, and music.

## Location

Irvine, California

## Website if you have one -

<http://student.vfs.com/~3d55joe/index.html>

## Skillset

3D Studio Max (Advanced), Softimage Xsi (Advanced), Adobe Photoshop (Advanced), Pixologic Zbrush (Advanced), Mudbox (Advanced), Newtek Lightwave (Basic), Adobe After Effects (Basic), Adobe Premiere (Basic), Deep Paint 3D (Basic)

## Interests

Film, sculpting, drawing, music, competitive video games





Thank You Joe for sharing your incredible images with us. I have no doubt we will be seeing a lot more from you in the future.

# Gregory J Strangis

## **Location**

New York

## **Website if you have one**

<http://gregstrangis.carbonmade.com/>

## **Skillset**

High Poly and Low Poly Modeling of Characters and Creatures for film, game and rapid prototyping.

## **How long have you been doing this?**

I started teaching myself almost 2 years ago now. I dabbled with Zbrush and Maya before that but didn't actually start to pursue it until taking my first class online with Alex Oliver then Cesar Decal Jr soon after.

## **What programs do you use?**

Zbrush, Mudbox, Maya, MentalRay, V-Ray, Photoshop, Topogun, HeadusUV, XNormal

## **How did you get started?**

I finally got started with everything after heading to Vancouver Film School back in 2008. I was set out to attend there Foundation Program then move on to the 3D Course the year after. Unfortunately with the recession it was impossible for me to obtain a loan and I was stuck with just a intro class to Maya under my belt. Since then I took the online class's with Alex Oliver and Cesar Decal Jr and been teaching myself ever since.

**Who has been an influence on your style / skill?**

I would have to say Todd McFarlane as I grew up on Spawn and always dreamed to make my own characters and creatures one day. Of course you have guys like Stan Winston and Phil Tippet that greatly influence me as well.

**What is your favorite Work to date? ( I will need an image for this)**

Well my favorite thing I have worked on so far I can't show yet since it has now come out heh. But of what I can show I think it would have to be Vranaxxas. It was the first piece to really get other Artists and Companies to notice me and it also won me the Evolve3d Contest which was a great experience.

**What projects are you working on now?**

Currently I am working on a character for the CGSculpt Boss Battle Challenge. Always a great time doing work for a contest with other artists there to push you further with your work.

**What tips / or advice would you give to people just starting out?**

Focus, Motivation and Determination. To me these are the most important aspects of it all. A big problem with myself and a lot of people I know is we spend so much time on unfinished projects due to lack of focus or motivation. When your in school trying to build a reel or at home teaching yourself you don't want to waste time and energy like that. Make sure that each project you do has a meaning behind it, whether to learn a new sculpting style, practice some hard surface or work on your texturing and rendering. That way after your done you will feel that sense of accomplishment and know you bettered yourself even more. For the people who are attending schools make sure you pick the brain of anyone who is more knowledgeable in something you want to learn. For the most part people in 3D like to help each other so you have to take advantage of that when you can. The last would be not to rush your work. I learned this the hard way



unfortunately. Most schools end up giving you at least 3-4months to work on your final portfolio or reel. Take advantage of that and just focus on making pieces that make people say "WOW" If that means you will only have 1-2 fully finished Models then so be it.





Thank You Greg for sharing with us, absolutely beautiful work. I am looking forward to seeing more.